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BOARD DECISIONS

1975 - 1976

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ENERGY RESOURCES CONSERVATION BOARD
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ENERGY RESOURCES CONSERVATION BOARD

Decision 75-1
Applications No. 7728 and
No. 7770

240-kV TRANSMISSION LINE
ELLERSLIE TO RED DEER

1. THE APPLICATIONS AND HEARINGS

Calgary Power Ltd. applied to the Board, pursuant to The Hydro and Electric Energy Act, for:

(a) authority to dismantle that part of existing transmission line CP 12L between a point near Ellerslie to a point near the City of Red Deer, as shown in Figure 1;

(b) a permit to construct a double circuit 240-kV steel tower transmission line on the route of the dismantled CP 12L from a point near Ellerslie to a point near the City of Red Deer, and then westerly on another existing right of way to the existing Red Deer Substation CP 63S, as shown in Figure 1;

(c) a licence to operate one circuit, designated as CP 910L, of the subject double circuit transmission line at 240 kV from its interconnection with CP 909L near Ellerslie to the existing Red Deer Substation CP 63S;

(d) a licence to operate that portion of CP 12L to be carried on the second circuit of the subject double circuit transmission line at 138 kV from one interconnection point with existing CP 12L near Ellerslie to the other interconnection point near the City of Red Deer;

(e) a licence to operate CP 909L at 240 kV from Sundance Power Plant to its interconnection with CP 910L near Ellerslie;

(f) the authority to raise the voltage to 240 kV for the existing 138-kV transmission line CP 712L and redesignate as CP 912L; and

(g) the authority to make alterations of electrical facilities for that part of existing transmission lines CP 901L and CP 712L located in the vicinity of CP 63S.

The applications were heard by the Board at Wetaskiwin on July 3, 1974, with V. Millard, J. I. Strong, P.Eng. and G. J. DeSorcy, P.Eng. sitting.

In November 1974, Calgary Power Ltd. applied to amend application No. 7728. The amendment specified proposed right of ways widths to comply with the provisions of the existing and proposed regulations under The Electric Protection Act of Alberta respecting safe clearances of transmission lines.

The amended application and its impact on the original applications were considered by the Board at a re-opened hearing at Wetaskiwin on December 3, 1974, with V. Millard, J. I. Strong, P.Eng. and G. J. DeSorcy, P.Eng. sitting.

The following appeared at the hearing:

	Represented by	Witnesses
Calgary Power Ltd.	D. O. Sabey, Q.C. H. M. Kay	E. J. MacLeod, P.Eng. R. E. Keyes, P.Eng. S. Johnson
Mr. & Mrs. R. Lachman	Mr. Lachman	
Arthur Stebner	Arthur Stebner	
J. T. Morrisroe, etc.	J. T. Morrisroe	
City of Red Deer	Mr. Rouhi	
Red Deer Regional Planning Commission	Mr. Rouhi	
M. J. Bilsborrow	M. J. Bilsborrow	
George A. Brown	George A. Brown	
Donald A. Stretch	Donald A. Stretch	
Edmonton Regional Planning Commission	D. Degrandis	
E. B. Bilsborrow	D. E. Bilsborrow	

	Represented by	Witnesses
Department of Highways and Transport	R. Sawchuk	
The City of Edmonton	H. Wilson	
Department of the Environment	F. Schulte	
Board staff	C. J. Goodman, P.Eng. A. L. McLarty J. N. G. Yu, P.Eng.	

Mr. Stretch's submission concerned compensation for surface rights for the right of way of the proposed transmission line. The Board advised Mr. Stretch at the hearing that matters of compensation respecting surface rights were not within the authority of the Board but were the responsibility of the Surface Rights Board.

2. THE BACKGROUND AND THE ISSUES OF THE APPLICATIONS

The need for the proposed transmission line and the timing of construction were discussed in the Board's report ERCB 74-B, entitled "In the Matter of an Application of Calgary Power Ltd. Respecting a Transmission Line from the Sundance Power Plant to East Edmonton". In that report, the Board reviewed load studies performed by Calgary Power Ltd. and concluded that, during the 1974-75 winter peak load period, the 240-kV transmission capability between the Lake Wabamun and Red Deer areas should be at least 500 to 600 MW. This conclusion implied that a third 240-kV transmission line, in addition to the two existing 240-kV lines, (CP 190L and CP 903L) would be needed by now, and should therefore be in service between the Lake Wabamun and Red Deer areas as soon as possible.

Since the immediate need for one additional 240-kV line has been established, the Board believes the two remaining issues to be considered are the route and the width of the right of way for the proposed transmission line.

3. THE ROUTE OF THE TRANSMISSION LINE

The applicant proposed a route for the subject 240-kV transmission line from Ellerslie to its Red Deer Substation CP 63S, and also presented alternatives for two sections of the proposed route: Alternate A for a portion of the route near Saunders Lake, and Alternate B for a portion of the route near the City of Red Deer. The proposed route and Alternates A and B are shown on Figure 1.

3.1 The Proposed Route

This section deals with the proposed route except for those portions that correspond to Alternates A and B.

3.11 Views of the Applicant

The applicant stated that the proposed transmission line would be 240-kV double circuit steel tower construction. Initially only one circuit, designated as CP 910L, would be operated at 240 kV, with the second circuit to carry the existing CP 12L operating at 138 kV. When the need arises, the second circuit would be raised to 240 kV and redesignated as CP 914L.

The applicant further stated that, except for one minor diversion to clear existing buildings, the proposed route for the transmission line would follow the existing right of way of transmission line CP 12L to a point near the City of Red Deer, and then proceed westerly on another existing right of way to Substation CP 63S. The CP 12L line was completed in 1929, and because of its age, keeping it in service would require extensive maintenance. Furthermore, by dismantling the existing CP 12L and replacing it with the proposed double circuit 240-kV transmission line, as much as 15 to 20 times more electric energy could be transmitted over the same right of way. The applicant stated that this additional transmission capacity would be required for the Provincial Interconnected Electric System and that effective utilization of the existing right of way could make acquisition of a new right of way unnecessary.

The applicant further stated that the proposed steel towers would be approximately 122 feet high and 1,200 feet apart as compared to the existing wood poles which are 45-50 feet high and 540 feet apart. The applicant assumed that the proposed transmission line would have a greater visual impact due to the taller steel towers even though the tower structures were less numerous. However, the towers would be constructed of galvanized steel which would tend to blend into the color of the sky and into the surrounding landscape when snow-covered.

The applicant contended that the existing right of way had been established for 44 years. Because most buildings and other installations had been built or planned to accommodate the right of way, future transmission line construction should result in minimal impact or disturbance to the adjacent landowners. The applicant stated that the installation of the proposed transmission line on the existing right of way would not have any significant effect on wildlife as the existing ground cover would not be destroyed, and that it would not adversely affect the development potential of the areas it would traverse.

3.12 Views of the Interveners

The Department of Highways and Transport indicated that it did not object to the route provided that provisions were made to avoid conflict with highway plans.

3.12 Views of the Board

The Board considers dismantling an old 138-kV line and replacing it with a double circuit 240-kV line on the same right of way to be a reasonable practice. It would increase the transmission capacity of the same right of way by 5 to 10 times and actual energy transmitted by 15 to 20 times. Thus, the need to acquire a new right of way with its associated problems is eliminated.

The Board believes that although the proposed double circuit steel tower transmission line may have a greater visual impact than the existing wood pole transmission line, the impact will be no greater and may be less than if a completely new route had been selected.

Having regard to the foregoing and in view of the fact that no comment was made at the hearing regarding other suitable routes, the Board believes the proposed route to be satisfactory.

3.2 Alternate A

3.21 Views of the Applicant

The applicant stated that Alternate A would be situated away from the developing country residential subdivision north of Saunders Lake, while the proposed route would pass through the subdivision. Also, Alternate A would be located about one-half mile west of Saunders Lake, as compared with the proposed route which would be very close to the lake; therefore, Alternate A would have less environmental impact to the lake. The applicant, however, contended that Alternate A would be one-half mile longer than the corresponding portion of the proposed route resulting in an additional construction cost of some $115,000; an increase in electrical losses; an increase in operating, maintenance and tax costs; and some additional tree clearing and environmental impact. The applicant further contended that Alternate A would create an imposition on lands adjacent to it.

3.22 Views of the Interveners

The Edmonton Regional Planning Commission favored Alternate A. It contended that the upgrading of the transmission line on the proposed right of way would have an adverse impact on the approved or registered country residential subdivision near Saunders Lake and the recreational potential of Saunders Lake itself.

Mr. E. B. Bilsborrow stated that he objected to any changes to the existing lines but would agree to granting a right of way along his quarter section line with half of the right of way taken from the adjoining property.

A number of the property owners along Alternate A objected to this alternative. The basis for their objection was stated as inconvenience to farming, decrease in land values, damage to trees, destruction of natural habitats for birds and animals, and aesthetic impact. They contended that the existing right of way should be used instead of the alternative, which would establish an imposition on their lands.

3.23 Views of the Board

The Board notes that Alternate A would be one-half mile longer than the corresponding portion of the proposed route, resulting in additional construction and operating costs, additional electrical losses, and some additional environmental impact.

The Board recognizes that the proposed route would create some difficulties for the residential subdivision currently under development north of Saunders Lake. However, adoption of Alternate A would simply transfer these difficulties to the property owners along Alternate A, a large number of whom have registered objections. As the existing right of way has been used for over 40 years, the Board believes that its existence should have been considered in the planning of any new subdivision near it. The Board agrees that the proposed route will have some visual impact on the area near the lake, if and when the lake is developed for recreational purposes, but does not believe the impact will be significant enough to spoil the recreational potential of the lake.

With regard to Mr. E. B. Bilborrow's objection, the Board notes that there will be no change in right of way width in this section of the proposed route. The only change will be the steel towers about 122 feet high and 1,200 feet apart instead of the existing wood poles, 45-50 feet high and 540 feet apart. The Board believes that farming operations will be simplified by the smaller number of towers.

All things considered, the Board is satisfied that the advantages of the proposed route outweigh the advantages of Alternate A. However, the Board believes that the location and spacing of steel towers in this section of the proposed route should be carefully considered in order to minimize their impact on country residential subdivisions and on Saunders Lake recreational potential.

3.3 Alternate B

3.31 Views of the Applicant

Alternate B is adjacent and parallel to quarter section lines and is 1.5 miles longer than the corresponding portion of the proposed route, which runs diagonally to the section line and, for approximately one-third of a mile, is within the boundaries of the extreme southeast corner of the City of Red Deer.

The applicant stated that Alternate B would require an extra construction cost of some $177,000; additional electrical losses; an increase in operating, maintenance and tax costs; and additional tree clearing. The applicant further stated that choosing Alternate B would only result in transferring the impact of the proposed transmission line from a group of owners already conditioned to a line to a new group of owners.

The applicant contended that moving the line one-half mile further east of Alternate B as proposed by the City of Red Deer and the Red Deer Regional Planning Commission would cause further additional costs, electrical losses, and disturbances. In addition, the transmission line would be located on higher ground making the steel towers more conspicuous, and would be within an area where some radio and television transmitters are located.

3.32 Views of the Interveners

Most of the property owners along the proposed route supported Alternate B. Their reasons were as follows:

(1) Since the wood towers have been on the existing route for 45 years, the proposed steel towers could have a lifetime of 50 to 100 years. Therefore, the transmission line location should be based on long-range planning for the area rather than short-term convenience.

(2) The proposed route does not follow property lines, but angles across lands resulting in a nuisance to farming operations.

(3) The proposed route would interfere with future urban residential development in the area.

Both the City of Red Deer and the Red Deer Regional Planning Commission objected to the proposed route. They stated that the City of Red Deer was experiencing a reasonable rate of growth and that soon the City would be extending eastward into the area the proposed route would traverse. This could create physical and environmental conflict with residential development in the area. They further stated that a utility right of way located diagonally across section lines would make the design and layout of residential subdivisions very difficult and costly compared to a utility right of way parallel and adjacent to a road allowance or quarter section line. The City of Red Deer and the Red Deer Regional Planning Commission submitted that a route one-half mile east of Alternate B and parallel to a road allowance should be adopted with no cost levied against the City of Red Deer.

3.33 Views of the Board

The Board is aware that the City of Red Deer is growing and will likely expand eastward into the area the proposed route would traverse. The Board also agrees that a utility right of way running diagonally across section lines would make the development of adjacent land for residential purposes less efficient and more costly than one parallel to section lines.

The Board notes that no objection has been registered from property owners along Alternate B. Having regard for the objections of the land owners along the proposed route, the absence of objections from land owners along Alternate B and the orderly expansion and development of the City of Red Deer, the Board believes that Alternate B is a more satisfactory route than the proposed route.

With respect to the proposal to place the proposed transmission line one-half mile east of Alternate B, the Board believes that there are not enough advantages to justify the extra capital and operational costs, the additional visual impact, and the possible interference with television and radio transmitters located in the immediate vicinity.

4. WIDTH OF THE RIGHT OF WAY

4.1 Views of the Applicant

The width of the existing right of way for that portion of CP 12L which will be dismantled varies from 40 feet to 88 feet. At the reconvened hearing, the applicant stated that it would acquire an additional right of way so that a minimum width of 80 feet of right of way would be provided for the proposed transmission line. The minimum width of 80 feet was based on space requirement for construction. The applicant further stated that it would take the necessary measures to comply with the provisions of existing and proposed regulations under The Electrical Protection Act of Alberta respecting safe clearances of transmission lines from existing buildings and structures. The applicant also stated that it should be the responsibility of the builder and developer of future buildings and structures adjacent to the proposed transmission line to provide safe clearances as required by the latest regulations issued pursuant to The Electrical Protection Act of Alberta. The applicant said, however, that it was prepared to patrol the route of the transmission line at least once every year to assist in ensuring that any future buildings or other structures, adjacent to the transmission line, comply with the required safe clearances.

4.2 Views of the Board

The Board considers that the proposed minimum width of 80 feet for the right of way and the measures to be taken by the applicant to comply with the required safe clearances for the proposed transmission line are fair and reasonable.

5. MINISTERIAL APPROVAL

The Hydro and Electric Energy Act, section 10, subsection (1), provides that the Board shall refer an application for a permit to the Minister of the Environment and the Minister of Lands and Forests for their approval of the application as it affects matters of the environment.

The Board, in compliance with the above, has referred the subject applications to the Minister of the Environment and the Minister of Lands and Forests and they have given their approval of the applications. Accordingly, their respective approvals have been incorporated as Appendices A and B to the Board's proposed Permit and Licence No. CP 75-3, set out in Appendix I, and the Board has made its permit subject to the same condition imposed by the Minister of the Environment and the Minister of Lands and Forests in their approvals.

6. DECISION

Having regard for its responsibilities under The Hydro and Electric Energy Act, the Board is prepared to issue to the applicant a permit to construct a 240-kV double circuit steel tower transmission line on a route as shown in Appendix C, and licences to operate CP 909L from Sundance Power Plant to Ellerslie at 240 kV, CP 910L from Ellerslie to substation CP 63S at 240 kV, and that portion of CP 12L carried on the second circuit of the subject double circuit line from Ellerslie to a point near the City of Red Deer at 138 kV. The Board is also prepared to issue an approval to the applicant to dismantle that part of the existing CP 12L from a point near Ellerslie to a point near the City of Red Deer as shown in Figure 1, to raise the voltage of CP 712L to 240 kV, and to make alterations on electrical facilities for that part of CP 901L and CP 712L located in the vicinity of CP 63S.

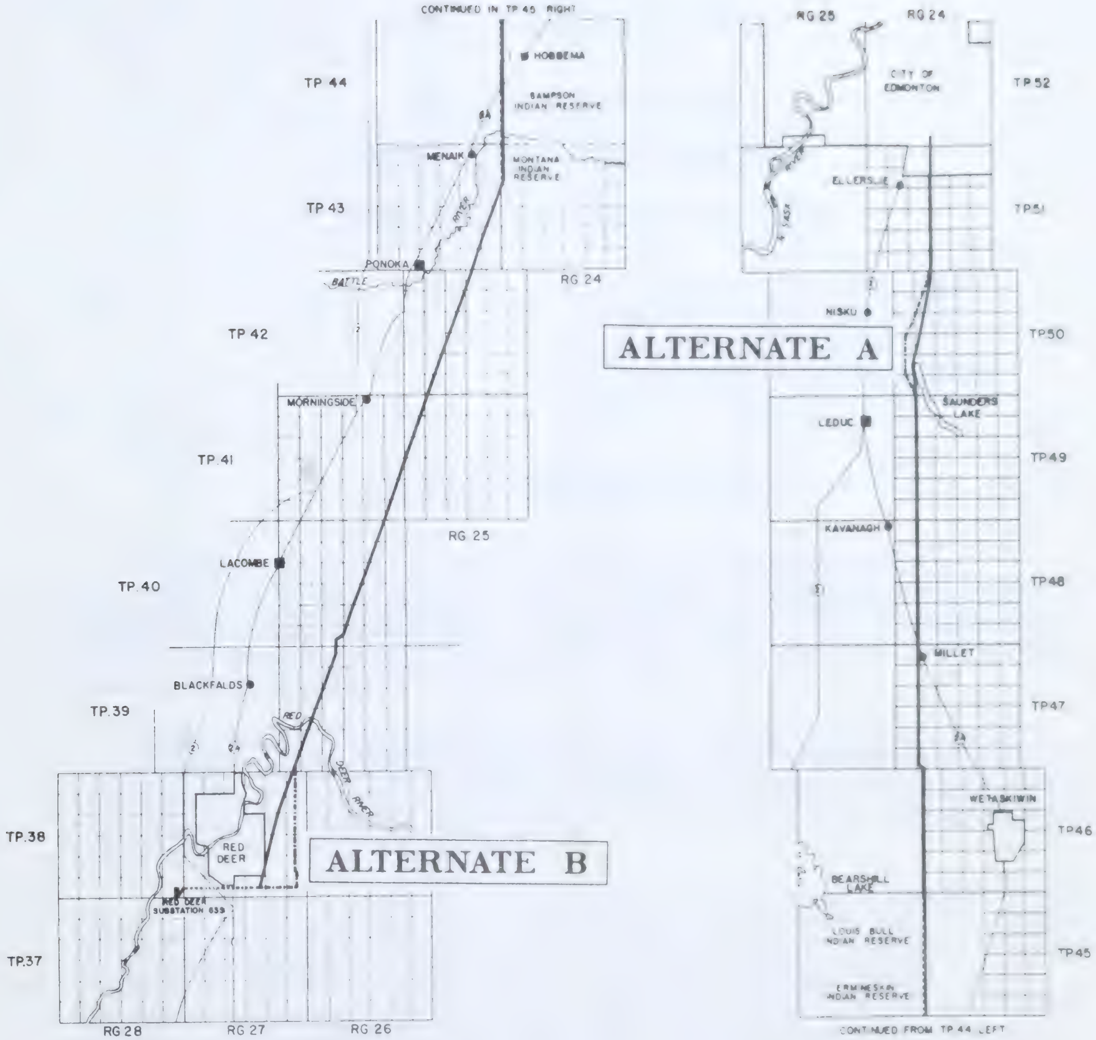
The form of the permit, licences and approval to be issued is set out in Appendices I, II and III.

ENERGY RESOURCES CONSERVATION BOARD

Vernon Millard

Vernon Millard
Vice Chairman.

January 29, 1975.



—— PROPOSED ROUTE OF CALGARY POWER LTD.'S 240KV DOUBLE CIRCUIT STEEL TOWER TRANSMISSION LINE ON AN EXISTING RIGHT OF WAY FOR CP 12L

·········· PROPOSED ROUTE OF CALGARY POWER LTD.'S 240KV DOUBLE CIRCUIT STEEL TOWER TRANSMISSION LINE ON AN EXISTING RIGHT OF WAY FOR CP 712L

-·-·-·-·- OTHER ALTERNATIVE ROUTES STUDIED OR CONSIDERED

FIGURE 1

ENERGY RESOURCES CONSERVATION BOA
CALGARY ALBERTA

APPENDIX I

FORM OF PERMIT AND LICENCE

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of a permit and
licence to Calgary Power Ltd.
authorizing the construction
and operation of a transmission
line from Ellerslie to Red Deer

Permit and Licence No. CP 75-3

WHEREAS Calgary Power Ltd., by applications dated April 18, 1974, May 3, 1974 and November 4, 1974, applied to the Energy Resources Conservation Board for a permit to construct and a licence to operate a double circuit steel tower transmission line from a point near Ellerslie to Red Deer Substation CP 63S; and

WHEREAS the Board is prepared to grant the applications, subject to the terms and conditions herein contained, and the Minister of the Environment and the Deputy Minister of Lands and Forests have given their approval, hereto attached as Appendices A and B insofar as the applications affect matters of the environment.

THEREFORE, the Energy Resources Conservation Board, pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, hereby grants to Calgary Power Ltd. (hereinafter called "the Operator") a PERMIT to construct and a LICENCE to operate a double circuit transmission line, designated as CP 910L and CP 12L, subject to the provisions of the Act and regulations and orders made pursuant thereto and to the following terms and conditions:

1. The route of the transmission line shall be as shown on the attachment hereto marked Appendix C.

2. The specifications of the transmission line shall be as follows:

   (a) the insulating and supporting structures shall be built for a nominal voltage level of 240 kV,

   (b) the supporting structures shall be double circuit steel tower construction, and as more particularly described in the application to the Board from the Operator dated April 18, 1974, May 24, 1974 and November 4, 1974.

3. (1) One circuit of the said 240 kV transmission line, designated as CP 910L, shall be operated at 240 kV and the second circuit, designated as CP 12L, shall be operated at 138 kV.

(2) The circuit designated as CP 12L, may at any time, subject to the prior approval of the Board, be increased to 240 kV and re-designated as circuit CP 914L.

4. The Operator shall ensure that all necessary minimum safe clearances are maintained from the said transmission line, as such may be prescribed by any lawful provision of the Province of Alberta, but under no condition shall the minimum width of right of way on which the said transmission line is constructed be less than 80 feet.

5. The Operator, prior to commencement of actual construction thereof, shall submit to the Board for final approval construction plans of the location of the steel transmission towers to be erected upon the right of way through sections 5, 6, 7, 17, 18, 20, 29 and 32, all in Township 50, Range 24, West of the 4th Meridian.

6. The Operator shall satisfy the Board within 30 days of the completion of the construction of the transmission line that such construction has been in accordance with the provisions of this Permit and Licence and The Electrical Protection Act and regulations and orders pursuant to that Act.

7. The Operator shall notify the Board within 30 days of the time that each transmission circuit is first energized, that the transmission circuit has been energized and is operating within a specified voltage range.

8. This Permit and Licence, insofar as it pertains to matters of the environment, is

(a) subject to the approval of the Minister of the Environment, hereto attached as Appendix A, and

(b) subject to the approval of the Deputy Minister of Lands and Forests, hereto attached as Appendix B,

and to the terms and conditions therein contained.

9. (1) This Permit and Licence expires one year from the date hereof, or such later date as the Board may stipulate, unless construction of the transmission line, as permitted herein, has been completed.

(2) The Board, on its own motion or upon the application of an interested party, may stipulate such later date by which construction is to be completed as it may consider suitable under the circumstances.

10. The Board may

(a) cancel or suspend this Permit and Licence, in whole or in part, for failure of the Operator to comply with any provision of the Act, the regulations, or the terms and conditions set out herein, or

(b) amend this Permit and Licence as it deems suitable in the circumstances.

MADE at the City of Calgary, in the Province of Alberta, this day of , 1975.

ENERGY RESOURCES CONSERVATION BOARD

Vernon Millard
Vice Chairman

Appendix A to Permit and Licence No. CP 75-3

Department of the Environment

MINISTERIAL APPROVAL

No. CP 75-33 ERCB

Edmonton, Alberta
February 17, 1975

Pursuant to section 10 of The Hydro and Electric Energy Act, I, William J. Yurko, Minister of the Environment, hereby approve Applications No. 7728 and 7770, dated April 18, 1974, May 3, 1974 and November 4, 1974 from Calgary Power Ltd. to the Energy Resources Conservation Board, in the matter of the construction of a double circuit steel tower transmission line from a point near Ellerslie to the Red Deer Substation CP 63S, insofar as it affects matters of the environment.

MINISTER OF THE ENVIRONMENT

Appendix B to Permit and Licence No. CP 75-3

Department of Lands and Forests

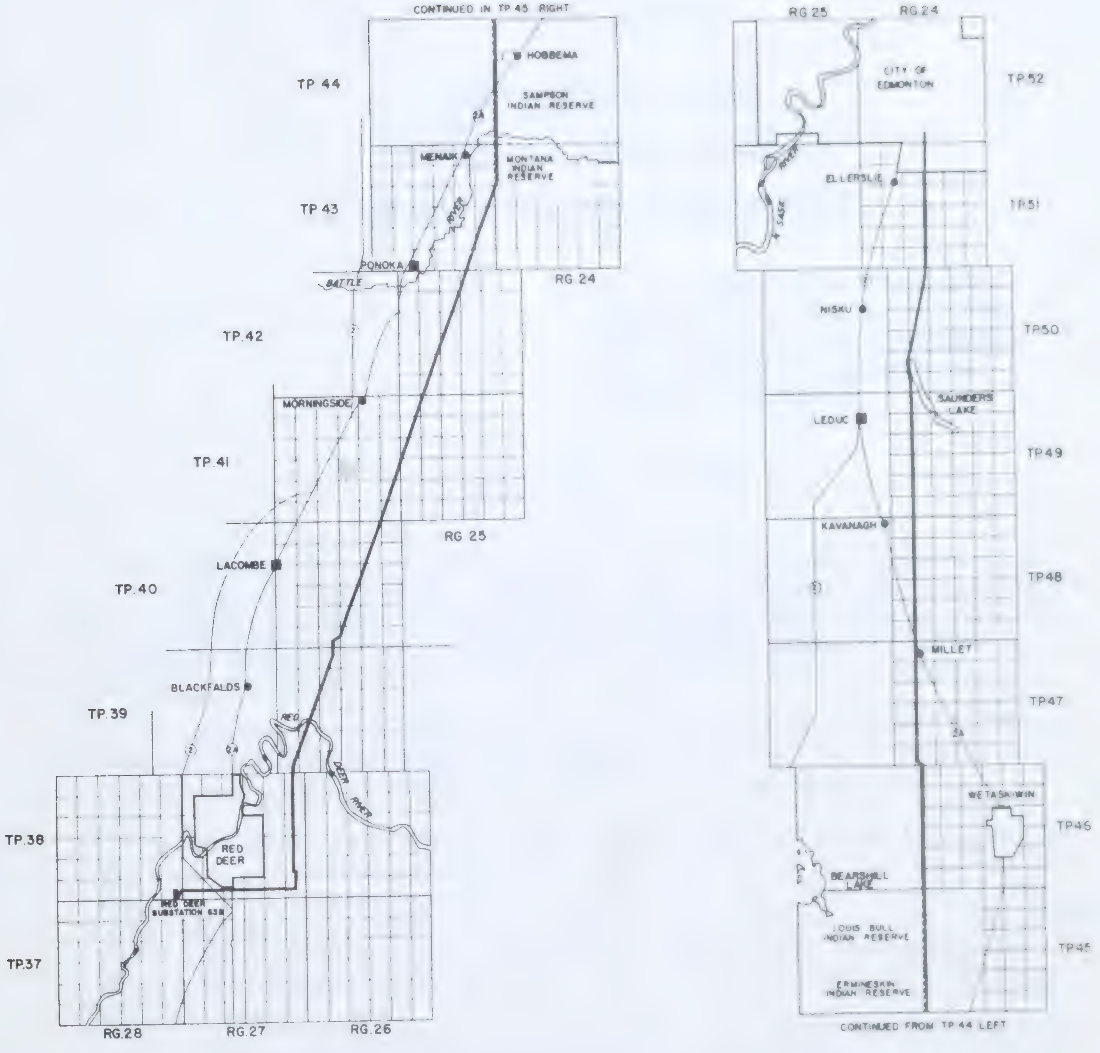
MINISTERIAL APPROVAL

No. CP 75-3 ERCB

Edmonton, Alberta
JAN 31 1975

Pursuant to section 10 of The Hydro and Electric Energy Act, I, R. G. Steele, Deputy Minister of Lands and Forests, hereby approve Applications No. 7728 and 7770, dated April 18, 1974, May 3, 1974 and November 4, 1974 from Calgary Power Ltd. to the Energy Resources Conservation Board, in the matter of the construction of a double circuit steel tower transmission line from a point near Ellerslie to the Red Deer Substation CP 63S, insofar as it affects matters of the environment, such application to be granted by the Board's Permit and Licence No. CP 75-3.

DEPUTY MINISTER OF LANDS AND FORESTS



APPENDIX C TO PERMIT AND LICENCE NO. CP 75-3

——— ROUTE OF 240-KV DOUBLE CIRCUIT STEEL TOWER TRANSMISSION LINE

ENERGY RESOURCES CONSERVATION BOARD
CALGARY, ALBERTA

APPENDIX II

FORM OF LICENCE

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of a licence to
Calgary Power Ltd. authorizing
the operation of a transmission
circuit from Sundance Power
Plant to Ellerslie

LICENCE NO. CP 75-4

WHEREAS the Energy Resources Cosnervation Board, by Permit and Licence No. CP 74-1, dated January 23, 1974, authorized the construction by Calgary Power Ltd., of an unenergized transmission circuit from the Sundance Power Plant to a point near the west boundary of Section 3, Township 52, Range 24, West of the 4th Meridian; and

WHEREAS Calgary Power Ltd., by application dated April 18, 1974, applied to the Energy Resources Conservation Board, for a licence to operate the said transmission circuit, designated as CP 909L.

THEREFORE, the Energy Resources Conservation Board, pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, hereby grants to Calgary Power Ltd. (hereinafter called "the Operator") a licence to operate the transmission circuit, designated as CP 909L, subject to the provisions of the Act and regulations and orders made pursuant thereto and to the following terms and conditions:

1. Transmission circuit CP 909L from the Sundance Power Plant to its interconnection with circuit CP 910L, near Ellerslie, shall be operated electrically at a nominal voltage level of 240 kV.

2. The Operator shall notify the Board, within 30 days of the time that the subject transmission circuit is first energized, that the subject transmission circuit has been energized and is operating within a specified voltage range.

3. The Board may

   (a) cancel or suspend this Licence, in whole or in part, for failure of the Operator to comply with any provision of the Act, the regulations or the terms and conditions set out herein, or

   (b) amend this Licence as it deems suitable in the circumstances.

MADE at the City of Calgary, in the Province of Alberta, this day of , 1975.

ENERGY RESOURCES CONSERVATION BOARD

Vernon Millard
Vice Chairman

APPENDIX III

FORM OF APPROVAL

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of an approval to Calgary Power Ltd. authorizing the dismantling and the making of alterations on electrical facilities to portions of certain transmission lines in the Ellerslie to Red Deer area

APPROVAL NO. HE 7502

WHEREAS Calgary Power Ltd., by applications dated April 18, 1974, May 3, 1974 and November 4, 1974, applied to the Energy Resources Conservation Board, for approval to dismantle that portion of existing transmission line CP 12L from near Ellerslie to near Red Deer and to make alterations on electrical facilities to existing transmission lines CP 712L and CP 901L in the vicinity of substation CP 63S.

THEREFORE, the Energy Resources Conservation Board, pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, hereby orders as follows:

1. Approval is hereby granted to Calgary Power Ltd. to dismantle that portion of CP 12L as applied for and make alterations on electrical facilities to portions of certain transmission lines, designated as CP 712L and CP 901L, in the vicinity of substation CP 63S, as described in applications to the Board from Calgary Power Ltd., dated April 18, 1974, May 3, 1974, and November 4, 1974, and in evidence submitted in connection with the hearing of the said applications held on July 3, 1974 and December 3, 1974, subject to the provisions of the Act and regulations and orders made pursuant thereto and to the terms and conditions herein contained.

2. (1) This Approval expires one year from the date hereof, or such later date as the Board may stipulate, unless dismantling and alterations, as herein approved, have been completed.

(2) The Board, on its own motion or upon the application of an interested party, may stipulate such later date by which operations and alterations are to be completed as it may consider suitable under the circumstances.

3. The Board may

(a) cancel or suspend this Approval, in whole or in part, for failure of the holder to comply with any provision of the Act, the regulations or the terms and conditions set out herein, or

(b) amend this Approval as it deems suitable in the circumstances.

MADE at the City of Calgary in the Province of Alberta, this day of , 1975.

ENERGY RESOURCES CONSERVATION BOARD

Vernon Millard
Vice Chairman

ENERGY RESOURCES CONSERVATION BOARD

Decision 75-2
Application No. 7954

GAS PROCESSING PLANT
ROSEVEAR FIELD

1 INTRODUCTION

1.1 The Application and Hearing

Sun Oil Company Limited applied under section 38 of The Oil and Gas Conservation Act for a permit to construct a gas processing plant in the North-east quarter of Section 33, Township 54, Range 15, West of the 5th Meridian. The plant would be designed to process 31.0 million cubic feet per day of raw sour gas from the Rosevear Field, and produce 25.0 million cubic feet of residue gas, 282 barrels of pentanes plus and 82 long tons of sulphur per day. The maximum permitted daily sulphur dioxide emission rate would be 12.3 long tons, and sulphur dioxide would be discharged to the atmosphere through a 300-foot incinerator stack.

The application was heard by the Board at Edson, Alberta on December 5, 1974, with D.R. Craig, P.Eng., N. Berkowitz and G.J. DeSorcy, P.Eng., sitting.

Interventions to the application were received from Mr. P. Bodner, Mr. J. Campbell, Mr. J. Casey, Mrs. B. Johnston, Mr. R. Kneteman, Mr. S. Maertz, Mr. R. Murry, Mr. G. Schultz, Mr. T. Semeniuk, Mr. W. Smith, Mr. R. Twiss and Mrs. K. Twiss.

Mr. P. Bodner, Mr. S. Maertz, Mr. R. Murry and Mr. W. Smith were not represented at the hearing.

1.2 Appearances

The following appeared at the hearing:

	Represented by
Sun Oil Company Limited (Sun)*	R. Egglestone, P.Eng. M. Frith, P.Eng. Dr. D. Leheay (of Western Research and Development Ltd.)

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* Abbreviation used in this report

	Represented by
Mr. J. Campbell	Mr. J. Campbell
Mr. J. Casey	Mr. J. Casey
Mrs. B. Johnston	Mrs. B. Johnston
Mr. R. Kneteman	Mr. R. Kneteman
Mr. G. Schultz	Mr. G. Schultz
Mr. T. Semeniuk	Mr. T. Semeniuk
Mr. R. Twiss	Mr. R. Twiss
Mrs. K. Twiss	Mrs. K. Twiss
Department of the Environment (Department)*	F. Witthoeft, P.Eng.
Board Staff	A. L. McLarty L. A. Mazurek, P.Eng. R. J. Reimond, C.E.T.

1.3 Background

The proposed plant site is near the northwest corner of the Rosevear gas field, some 20 miles northeast of the town of Edson. The site is about 1½ miles south of a small lake called Bear Lake which is used for recreational purposes. At the lake there are public and private campgrounds and some 26 cottages that are occupied intermittently throughout the year. In addition, there are two permanent residences within an approximate one-mile radius of the proposed plant site. The proposed plant site, Bear Lake, the McLeod River and other local features are shown on the attached Figure 1.

Section 9.020, clause (3) of the Oil and Gas Conservation Regulations requires that, where the Board's disposition of an application may directly or adversely affect the rights of any person, the Board publish notice of the application or hold a public hearing. Accordingly, having regard for the type of processing facility proposed by Sun, the Board advertised the application for possible objections in the Edmonton Journal, the Calgary Herald and the Albertan, and distributed copies of the notice to local residents, including the cottage owners at Bear Lake.

A public hearing was set upon receipt of objections, and notice thereof was given to the interveners as well as to all other recipients of the earlier notice for objections. The Board is satisfied that this procedure brought the application to the attention of all persons having a bona fide interest in the matter.

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* Abbreviation used in this report

2 DEFINITION OF ISSUES

The Board considers the principal issues of the subject application to be (a) conservation levels at the proposed plant, and (b) the suitability of the proposed plant location, and believes the latter to be particularly important.

3 CONSERVATION LEVELS

3.1 Views of Sun

Sun submitted that, at the proposed sulphur recovery efficiency of 93 per cent, its plant would fully meet the requirements of the Board's guidelines as set out in Informational Letter IL 71-29. Sun also pointed out that it would exceed process requirements by installation of a three-stage Claus plant even though a two-stage plant or its equivalent would actually suffice. The applicant further noted that the proposed use of condensate stabilizer overhead vapours for fuel would avoid flaring of hydrocarbons during normal plant operations and that, in accordance with company policy, the plant would be designed to operate at a high level of efficiency in order to conserve energy.

3.2 Views of the Interveners and the Department

Neither the interveners nor the Department commented on matters related to conservation.

3.3 Views of the Board

The Board accepts the applicant's submissions and agrees that the proposed plant will meet or exceed all required levels of conservation.

4 THE PROPOSED PLANT LOCATION

4.1 Views of Sun

Sun contended that the proposed location of the processing plant met its plant siting criteria, which include:

(a) proximity to the wells,

(b) siting at the highest accessible elevation,

(c) due regard to the ecology of the terrain,

(d) sufficient distance from existing plants to ensure satisfactory sulphur dioxide dispersion,

(e) adequate distance from densely populated areas,

(f) proximity to existing utilities (such as electricity, telephone, water supply and roads),

(g) suitable soil conditions,

(h) minimum land disturbance on the plant site and minimum use of productive agricultural land, and

(i) reasonable cost.

Sun further contended that satisfactory alternate sites would lie at considerable distances from the wells from which the proposed plant would draw its raw gas, and that locating the plant at any of these sites would incur substantially greater capital and operating costs, as well as increase operating problems and the probability of pipe line breaks.

With regard to the feasibility of using existing facilities, Sun stated that it had looked into the possibility of processing the gas in the Edson plant operated by Hudson's Bay Oil and Gas Company Limited. Sun stated that as one of the Edson plant owners it was aware that the Edson plant is already operating near full capacity and additional field compression or additional wells drilled to maintain deliverability from the Edson Field would undoubtedly maintain very high plant load levels. Sun also pointed out that the sour Rosevear gas could not be processed in the Edson plant without significantly modifying the plant. Use of the Edson plant would, in any event, require a 20-mile sour gas pipe line and, in view of a recent Board denial of an application for a similar line because of environmental concerns and availability of suitable processing sites near the source of gas, Sun did not think it worthwhile to further pursue possible processing of its gas in the Edson plant.

Under questioning, Sun said that it considered it inadvisable to locate the plant south of the McLeod River, since access would then require three pipe line crossings of the river and thereby create greater potential environmental hazards. Building a plant south of the river would also increase costs since the river crossings, greater pipe line length, additional well head equipment, and land would all require additional expenditures.

In reply to questions concerning truck traffic generated by the plant, Sun stated that six or seven truck loads per day would be required for moving products from the plant. In addition, occasional trucks would be needed to bring materials and equipment to the plant during and after construction.

Sun indicated that the two wells which would be connected to the proposed plant will load it to capacity, and that the plant was therefore unlikely to be utilized for processing of additional gas from other areas unless capacity were increased. In this connection, Sun stated that it was unaware of any additional gas reserves south of the river but recognized that some drilling was in progress in that area.

4.2 Views of the Interveners

Most of the interveners considered that it would be desirable to relocate the plant further from Bear Lake, with some observing that a plant at the location proposed by Sun would raise noise levels at Bear Lake and increase truck traffic on local roads. The interveners also pointed out that the natural drainage pattern from the proposed location towards Bear Lake through a chain of small lakes and streams would tend to move spills at the plant or sulphur washed from the storage area into the lake. As well, one intervener suggested that wildlife in the vicinity would be driven away or destroyed, either directly by plant emissions or indirectly by plant employees. The proposed plant site was also deemed unacceptable on aesthetic grounds, since the incinerator stack would likely be visible from the lake.

Many interveners favoured a location south of the McLeod River, and contended that a plant there would reduce or eliminate noise, odours and environmental hazards at the Bear Lake resort. In addition, some interveners stated that locating the plant near the railway south of the river would reduce or eliminate truck transport of products from the plant site, and that the flat area south of the river would aid in the dispersion of gaseous pollutants. They also saw another reason for locating the plant south of the McLeod River in the possibility of additional gas being discovered by drilling now in progress in that area.

Several interveners contended that cost should not be an overriding factor in determining a suitable plant site.

4.3 Views of the Board

The Board agrees with Sun that the only existing gas processing facility in the area, the Edson plant, is operating at or near capacity, and that it would be impractical to process the sour Rosevear gas in that plant even if spare capacity were available. The Board also believes that long high-pressure sour gas transmission lines are undesirable on environmental grounds if reasonable other alternatives exist.

However, while the Board accepts the relevance and utility of Sun's site selection criteria, it is not satisfied that the proposed plant location meets these criteria or offers any unique advantages.

(a) As regards "proximity to wells" the Board notes that there are two capped gas wells south of the McLeod River, and that a recently cased third well (in LSD 7 of Section 14, Township 54, Range 15, West of the 5th Meridian) may also be a potential producer. The location of these wells are shown on Figure 1. The Board accordingly believes that the area south of the river may produce significant quantities of gas. But if so, and if - as would seem desirable - such gas comes to be processed in the proposed plant or an expansion thereof, the site chosen by Sun would no longer be a central one, and any advantage now thought to attach to it would be lost. The Board observes, in this connection, that it does not favour a multiplicity of small gas processing plants in a relatively small area and believes that environmental impact can generally be better controlled by one large efficient plant.

The Board agrees that a central location advantage would also be lost, and that greater costs would be incurred, if the proposed plant were located south of the river and little or no gas became available there. However, the higher costs might, even in that event, be partly offset by shorter product haul distances. Unfortunately, the applicant offered no direct evidence regarding capital costs associated with alternative sites, and the Board is therefore unable to draw any firm conclusions about this matter.

(b) The Board agrees with Sun that the proposed plant site has a modest height advantage and thus conforms with the "highest accessible elevation" criterion. But since the local terrain is generally flat, the Board believes that the same advantage could easily be gained at other sites by, if necessary, slightly increasing the stack height. The incremental cost of any such addition is likely to be modest.

(c) With respect to "due regard to the ecology" and "adequate distance from densely populated areas" criteria, the Board considers that Sun, in selecting the proposed site, did not give sufficient attention to the proximity of Bear Lake, to the cottage development at the lake, and to the nearness of other streams and lakes in the immediate area. In the Board's view, the "distance from populated areas" criterion ought, in itself, direct consideration of other sites.

(d) The Board does not believe that the "sufficient distance from existing plants" criterion is relevant in the context of Sun's application. There are obviously several other locations in the area that are equally remote from existing plants.

(e) With respect to proximity to existing utilities, the Board observes that the area is generally well supplied with roads, telephone lines and electric power, and that access to these facilities from several alternate locations would be as easy as from the site selected by Sun.

(f) While the Board is satisfied that the location proposed by Sun meets criteria respecting "suitable soil conditions" and "minimum encroachment on productive agricultural land", it believes that several alternative locations within a radius of 5 or 6 miles of the proposed site could meet them equally well.

(g) The Board accepts Sun's contention that the proposed site could be developed at reasonable cost, but believes that development of any other potential site in the immediate area would not necessarily incur greater costs.

The Board is satisfied that the environmental standards set out by the Department are reasonable and adequate to ensure the well being and safety of plant and animal life in the vicinity of a gas processing plant. It is also satisfied that Sun would construct and operate the proposed plant in full compliance with the requirements of the Department and the Board. The Board is not satisfied that the proposed site is the most appropriate location or that it offers advantages that could not be secured elsewhere. The Board is particularly concerned about the effect of the proposed plant on Bear Lake and local residents, and also sees significant shortcomings in the proposed site if producible gas reserves were to be established south of the McLeod River. On the evidence available to it, the Board believes that the proposed site is not, in fact, the best possible location, and that alternate sites, particularly to the east and south of the proposed site and south of the McLeod River, should be evaluated.

The Board recognizes that Sun's application, insofar as it relates to site location, complies with section 15.050 of the Oil and Gas Conservation Regulations, and that an application for approval of a gas processing scheme is not required to contain an appraisal of alternate plant sites. But having regard to the evidence presented at the hearing, the Board nevertheless considers that an evaluation of alternate sites is essential for proper disposition of the subject application and that Sun should be required to undertake such an evaluation.

The Board will also expect future applications for approval of new processing plants to set out in detail the reasons for a particular choice of a plant location, and to direct more attention to potential alternate sites. Where, in the applicant's view, a number of alternate sites would seem to be more or less equally suitable, the Board will expect that a first choice as well as one or two alternates be indicated.

5 DECISION

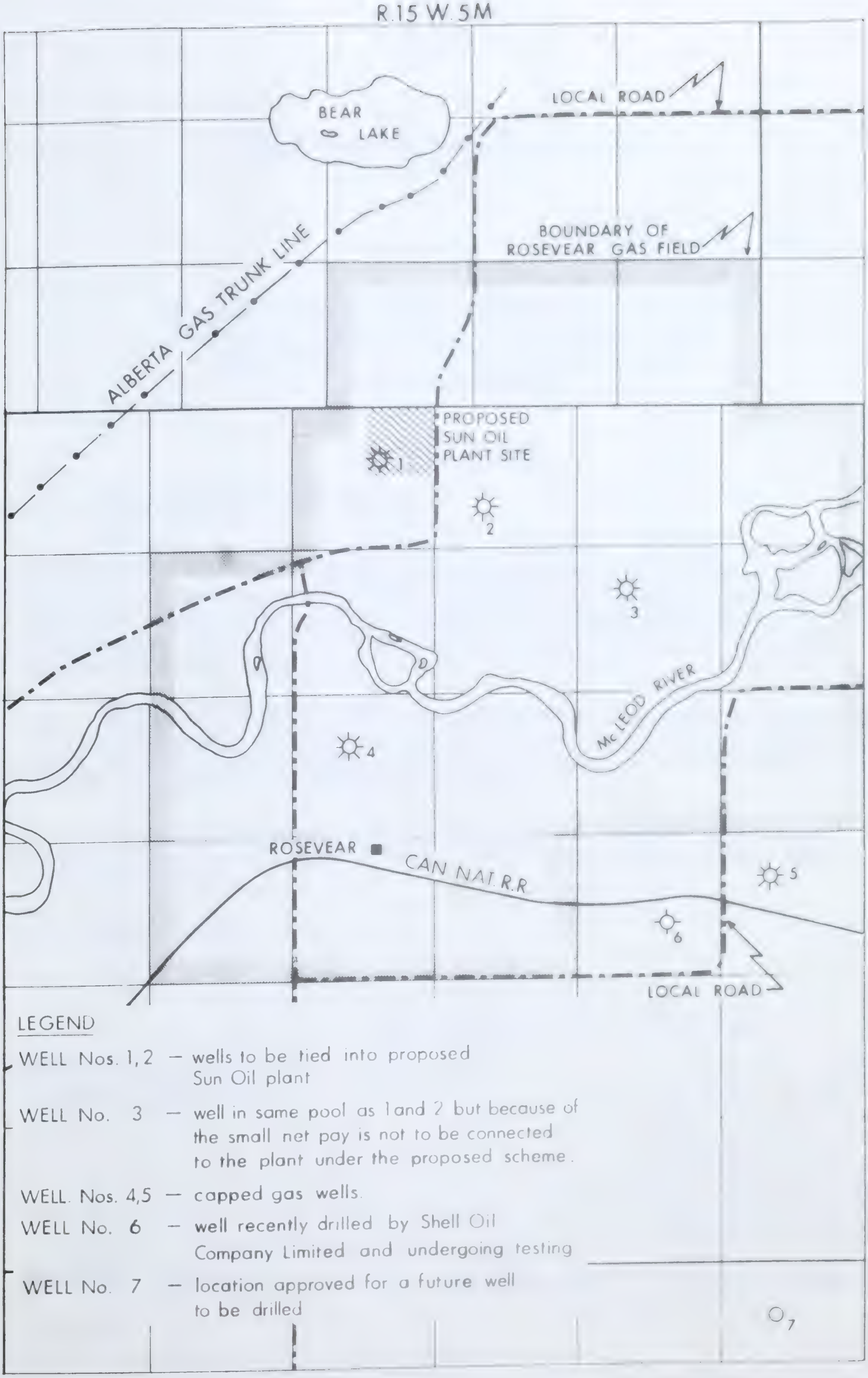
The Board defers its decision on the subject application until Sun has evaluated other potential plant sites and submitted its findings to the Board. Copies of the additional material should be provided to all interveners registered at the hearing. If, following its appraisal, Sun remains satisfied that the proposed site is the most suitable, the Board will consider the additional material filed by Sun and any further submissions by the interveners, and will make its final disposition of the application. But if Sun decides to amend its application with respect to plant location, the Board will ensure that an opportunity for appropriate review of the amended application by the public is provided.

The position of the Department respecting the proposed plant site has not been included in this report. It is understood that the Department's position will be conveyed to the Board prior to the final disposition of the application.

ENERGY RESOURCES CONSERVATION BOARD

D. R. Craig
Vice Chairman

February 7, 1975



LEGEND

WELL Nos. 1, 2 — wells to be tied into proposed Sun Oil plant

WELL No. 3 — well in same pool as 1 and 2 but because of the small net pay is not to be connected to the plant under the proposed scheme.

WELL Nos. 4,5 — capped gas wells.

WELL No. 6 — well recently drilled by Shell Oil Company Limited and undergoing testing

WELL No. 7 — location approved for a future well to be drilled

FIGURE - 1 TO DECISION 75-2

ENERGY RESOURCES CONSERVATION BOARD

Decision 75-3
Application No. 7976

DECLARATION OF THE CANDEL MINNEHIK-BUCK LAKE GAS PLANT AS A COMMON PROCESSOR AND DECLARATION OF THE MINNEHIK-BUCK LAKE GATHERING SYSTEM AS A COMMON CARRIER

1 INTRODUCTION

1.1 The Application and Hearing

Great Plains Development Company of Canada, Ltd. applied pursuant to section 54 of The Oil and Gas Conservation Act for a declaration that the owner or operator of the CanDel Minnehik-Buck Lake Gas Processing Plant be a common processor and pursuant to section 49 of the Act for a declaration that the proprietor of the Minnehik-Buck Lake Gathering System be a common carrier.

Notice of the application was published by the Board on October 25, 1974. Submissions of intervention to the application were filed by CanDel Oil Ltd., and by Canadian Superior Oil Ltd. Canadian Superior Oil Ltd. withdrew its intervention at the hearing.

The application was heard by the Board in Calgary, Alberta on November 20, 1974 with G. W. Govier, P.Eng., D. R. Craig, P.Eng. and V. Millard sitting.

1.2 Appearances

The following appeared at the hearing:

	Represented by	Witnesses
Great Plains Development Company of Canada Ltd. (Great Plains)*	G.F. Dixon	T.W. Adamson, P.Eng. F.T. Nadir, P.Eng. J.P. Letkeman, P.Eng. (D&S Petroleum Consultants Ltd.) G.L. Duckworth, P.Eng. (Duckworth & Price Engineering Ltd.)
CanDel Oil (CanDel)*	R.A. MacKimmie, Q.C.	J. Karberg, P.Eng.

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* Abbreviation used in this report

	Represented by	Witnesses
Board Staff	N.A. Macleod, Q.C. L.A. Mazurek, P.Eng. D.C. Wharton, EIT	

1.3 Background

The Minnehik-Buck Lake Pekisko A Pool was discovered in 1952 and was placed on production late in 1962. The Minnehik-Buck Lake Unit No. 1 (hereinafter referred to as "Unit No. 1") was formed in 1963 and was enlarged early in 1969 to include nearly all of the then proved reserves in the Pekisko A Pool. Following this enlargement, Unit No. 1 renegotiated its gas sales contract with Alberta and Southern Gas Co. Ltd. resulting in a daily contract quantity (DCQ) for the unit of 78.8 million cubic feet.

In December 1969, Great Plains and Amoco Canada Petroleum Company Ltd. drilled a successful Pekisko A well outside the boundaries of Unit No. 1 in 7-30-46-6 W5M. In mid-1971 the well was put on production to the CanDel Minnehik-Buck Lake Gas Processing Plant (hereinafter referred to as "the CanDel Plant") under a contract which provided that Unit No. 1 would take and process gas from the 7-30 well to the extent that the CanDel Plant had capacity in excess of Unit No. 1's needs.

In October of 1971 Great Plains drilled a second Pekisko A well outside the Unit No. 1 boundary in 10-8-46-6 W5M. In December 1972 Great Plains and Amoco Canada Petroleum Company Ltd. drilled a third well outside Unit No. 1 in 7-25-46-7 W5M which also encountered Pekisko gas. There has been no production from the 10-8 or 7-25 wells since they were completed.

In June 1973, Great Plains applied to the Board for approval to construct a second gas processing plant in the Minnehik-Buck Lake field in order to process gas from non-unitized reserves north and west of Unit No. 1. The application was denied following a hearing by examiners appointed by the Board on October 25, 1974, because local residents objected to the plant location and because the existing CanDel Plant provided an alternative processing facility. The application was denied without prejudice to further application by Great Plains, possibly involving expansion of the CanDel Plant or the construction of a new plant elsewhere. At this time Great Plains and others decided to form a Minnehik-Buck Lake Unit No. 2. At the time of hearing the subject application, the proposed Unit No. 2 had not been formally approved but for convenience the Board will hereinafter refer to the proposed unit as "Unit No. 2".

The CanDel Plant was expanded to its present design capacity of 100 million cubic feet per day in 1970-1971. Since then a number of operational problems have resulted in plant sales at a level well below the volumes requested by Alberta and Southern. A plant performance test was conducted in January 1974 to assess the plant processing capabilities. As a result, Unit No. 1 has initiated modifications to the CanDel Plant to increase its gas processing volume. Processing capacity at the plant is presently being used in a normal manner for the gas production from Unit No. 1 and on an interruptible service basis for gas produced by Great Plains's 7-30 well.

During the period 1971 to 1974, Great Plains and Unit No. 1 continued negotiations to expand Unit No. 1 and to process all of Unit No. 2's gas production at the CanDel Plant. The parties have not yet been able to reach agreement on either matter.

The participants and their working interest in Unit No. 1 and Unit No. 2 are shown in Attachment 1.

1.4 Provisions of the Legislation and Basis of Consideration

1.41 Application for Declaration of a Common Processor

Section 54 of The Oil and Gas Conservation Act reads in part

> "54. (1) Upon application and after a hearing, the Board, with the approval of the Lieutenant Governor in Council, may declare any person who is the owner or operator of a processing plant processing gas produced from a pool or pools in Alberta to be a common processor of gas from the pool or pools."

In considering an application under section 54, the Board believes it should be demonstrated to its satisfaction that:

(1) Producible gas reserves do exist and that gas processing facilities are needed.

(2) Reasonable arrangements for the use of processing capacity in the subject gas processing plant could not be agreed upon by the parties.

(3) The proposed common processor operation is either the only economically feasible way to process the gas in question or is clearly the most practical and desirable way.

1.42 Application for Declaration of a Common Carrier

Section 49 of The Oil and Gas Conservation Act reads in part

> "49. (1) Upon application and after a hearing, the Board, with the approval of the Lieutenant Governor in Council, may from time to time declare each proprietor of a pipe line in any designated part of Alberta or the proprietor of any designated pipe line to be a common carrier as and from a date fixed by the order for that purpose, and thereupon any

> such proprietor is a common carrier of oil, gas or synthetic crude oil or any two or all of them in accordance with the declaration."

In considering this particular application the Board believes that a decision on the matter of the Common Processor order is prerequisite to consideration of the Common Carrier application. Accordingly, the Board proposes to first deal with the Common Processor application. The Board believes that in considering an application under section 49 it should be demonstrated that:

(1) Gas reserves are available for production and transportation through existing pipe line facilities.

(2) The parties could not make reasonable arrangements to use existing pipe line facilities.

(3) The proposed common carrier operation is either the only economically feasible way to transport the gas in question or is clearly the most practical way.

2 THE PRESENT SITUATION

2.1 Producible Reserves

2.11 Views of the Applicant

Great Plains stated in its application that from a study made on its behalf by D & S Petroleum Consultants Ltd., the proposed Unit No. 2 had remaining gas in place of 53.28 billion cubic feet as of December 1970 and 49.40 billion cubic feet as of December 1973. It stated that the December 1970 date for gas in place calculations was not chosen for any specific reason except to show the amount of drainage over time.

Great Plains stated that in 1974 it had signed contracts for all of its reserves in Unit No. 2 with Alberta and Southern Gas Co. Ltd. Great Plains said that its working interest in Unit No. 2 reserves was 82 per cent and that its interest in Unit No. 1 was approximately 30.5 per cent. Its DCQ from Unit No. 2 would be slightly in excess of 7 million cubic feet.

2.12 Views of CanDel

CanDel indicated in its calculations submitted at the hearing that the remaining gas in place for Unit No. 2 was also 49.40 billion cubic feet as of December 1973. CanDel also contended that loss of reserves cannot occur until the owners have actually proved the reserves by specifically drilling wells.

2.13 Views of the Board

The Board is of the opinion that the Minnehik-Buck Lake Pekisko A Pool is sufficiently delineated to indicate that gas reserves do exist under the Unit No. 2 lands. The Board believes that some uncertainty exists in the determination of the pool gas-water interface due to fluctuating transition zones on the western edge of the pool and this results in some degree of uncertainty in the calculation of remaining gas in place. Having regard for this, however, the Board generally agrees with the estimates of both Great Plains and CanDel.

The Board agrees with CanDel that reserves should not be attributed to a leaseholder until those reserves are proved by drilling and testing a well or wells in that portion of the pool. The Board is not prepared to attribute gas reserves to Unit No. 2 lands until the dates of completion of the wells drilled to produce those reserves.

The Board concludes that the proved remaining gas in place in Unit No. 2 is about 49 billion cubic feet and that there are wells in Unit No. 2 able to produce these reserves. The Board also concludes that these reserves require processing facilities as the applicant has signed sales contracts for the subject gas.

2.2 Drainage

2.21 Views of the Applicant

In its application, Great Plains indicated that since 1970 Unit No. 2 has been depleted of 3.88 billion cubic feet, comprised of 1.90 billion cubic feet of production from 7-30 and 1.98 billion cubic feet drained to Unit No. 1. At the hearing, Great Plains stated that Unit No. 2 is being drained at the net rate of 54 million cubic feet per month. Applying a 10 per cent surface loss and a 42 cent per thousand cubic feet net gas price, Great Plains calculated the present loss of revenue due to drainage to be $20,000 per month. It also estimated that future drainage would be approximately 83 million cubic feet per month with a value of $31,000 per month assuming the same surface loss and gas price parameters. Great Plains did not explain the basis for its prediction that drainage would increase in the future.

2.22 Views of CanDel

CanDel stated that calculation of the amount of drainage of Unit No. 2 reserves should be based on that drainage occurring after the completion dates of each of the wells in Unit No. 2. Using this approach, CanDel calculated that the total depletion to December 31, 1973 from Unit No. 2 was 2.69 billion cubic feet comprised of 1.90 billion cubic feet of production from the 7-30 well and 0.79 billion cubic feet of drainage to outside the unit. CanDel also contended that if the Great Plains drainage figure of 1.98 billion cubic feet were used and that if Unit No. 2 was credited with 45 per cent of that amount by virtue of its ownership in Unit No. 1, the total receipts by Unit No. 2 owners through both production from Unit No. 2 and ownership in Unit No. 1 would be 2.79 billion cubic feet which would then result in an insignificant net loss. The Board notes that this calculation reflects a mixture of the estimates of CanDel and Great Plains.

CanDel stated that in producing the gas reserves of the pool some drainage was inevitable. However, it contended that more important than the actual drainage is the effect on the original owners of the gas.

2.23 Views of the Board

The Board agrees with CanDel that drainage calculations should be based on that drainage occurring after wells have been completed to delineate and produce the reserves. The Board concurs in part with the drainage calculations submitted by CanDel using individual well completion dates and agrees that the drainage from Unit No. 2 has been approximately 0.79 billion cubic feet.

The Board does not agree with CanDel that the drainage suffered by Unit No. 2 should be modified due to the participation of Unit No. 2 owners in Unit No. 1. The Board believes such inter-unit participation is not an issue in the determination of drainage.

The Board concludes that drainage from Unit No. 2 is presently taking place and could take place in the future.

2.3 Transportation

2.31 Views of the Applicant

Great Plains stated that the well 7-30 has been connected to the Minnehik-Buck Lake gathering system since 1971. The applicant also indicated that the 10-8 well was currently in the process of being tied into the CanDel Plant. In response to questioning, Great Plains stated that in the initial stages of production it would not be its intent to tie in the 7-25 well to the gathering system.

2.32 Views of CanDel

CanDel did not comment on the matter of transportation of gas to the plant.

2.33 Views of the Board

The Board concludes that there is at present, or there will soon be, sufficient pipe line capacity to transport gas from Unit No. 2 to the CanDel Plant at the maximum contract rate.

2.4 Processing in the CanDel Plant

2.41 Views of the Applicant

On the subject of past gas processing at the CanDel Plant, Great Plains stated in its submission that while CanDel had attempted to process as much gas as possible from the 7-30 well, the poor performance of the CanDel Plant and the nature of the processing agreement had resulted in the preferential shutting-in of the 7-30 well whenever plant problems occurred. It contended that the result of this had been that since May 1971 Unit No. 1 had produced 80 per cent of its nomination in comparision to 68 per cent of the nomination for the 7-30 well.

On the subject of the present capacity of the CanDel Plant, Great Plains referred to the plant performance test conducted for CanDel by Duckworth and Price Engineering Ltd. Great Plains stated that, using this information, the CanDel Plant could handle 100 million cubic feet per day of sales gas with some modifications to the sulphur plant and, with other modifications, the plant would be able to handle 115 million cubic feet per day. The present capacity of the CanDel Plant is slightly less than 100 million cubic feet per day because of limitations imposed by sulphur dioxide emission requirements. Great Plains stated that Unit No. 1 has recently approved an expenditure for equipment to modify the sulphur facilities at the CanDel Plant. The total DCQ for Unit No. 1 and Unit No. 2 is approximately 87.5 million cubic feet which would result in a maximum day obligation of 105 million cubic feet.

2.42 Views of CanDel

Regarding past production of Unit No. 2 gas, CanDel commented that if Great Plains had taken advantage of past offers by Unit No. 1 for gas processing, Unit No. 2 could have increased its gas sales to date by approximately 1.3 billion cubic feet.

Regarding plant capacity, Candel stated that as the plant operator, it has intimate knowledge of the behaviour of the plant. CanDel stated that the sulphur dioxide emission standards impose on the plant an operating restriction of 95 million cubic feet per day of sales gas. With certain modifications to the plant, the sales volume could be increased to approximately 100 million cubic feet per day but this rate could not presently be achieved.

2.43 Views of the Board

The Board agrees with Great Plains that the history of gas processing at the CanDel Plant shows that Unit No. 2 has been unable to process its gas in the same proportion to reserves as gas from Unit No. 1.

The Board concurs with both parties that the present process capacity of the CanDel Plant is slightly less than 100 million cubic feet per day. The Board is of the opinion that, while the combined DCQ for both units could be processed in the plant at times, the maximum day obligation of both units (approximately 105 million cubic feet per day) could not be processed until plant modifications have been completed.

3 COMMON PROCESSOR APPLICATION AND ALTERNATIVES

3.1 Views of the Applicant

Great Plains based its application for a common processor declaration on the fact that it had failed after 4 years of negotiations to obtain access to uninterruptible processing capacity for the gas in Unit No. 2. Great Plains stated that initially it did not favour solving its problem through the Board but a common processor declaration now appeared to be the only way in which the subject gas could be processed under reasonable conditions and was the only way to prevent further drainage.

Great Plains stated that its desire was to have the gas from Unit No. 2 processed in the CanDel Plant with a processing rate between the units proportional to the DCQ ratio between the units, in accordance with the normal understanding of a common processor. Great Plains would anticipate that following a common processor declaration, any deficiency in meeting the daily nominations for the CanDel Plant would be prorated between the two units. On such a DCQ basis Unit No. 2 would have approximately 9.2 per cent of the plant processing capacity. Great Plains stated that it would be able to sell its gas immediately if the subject application were granted. In the initial stages all the production from Unit No. 2 would come from the wells 7-30 and 10-8 and none from the 7-25 well and drilling of further wells in Unit No. 2 in the future was not anticipated.

Regarding the expansion of the CanDel Plant, Great Plains stated that in the event of a common processor declaration, it was prepared to pay its proper and equitable share of the plant costs necessary to increase the plant capacity. Great Plains expressed the belief that sulphur plant modifications to bring the plant capacity to 100 million cubic feet per day were currently underway at an approximate cost of $500,000. While it was unsure of the cost of any additional modifications, Great Plains estimated the cost of increasing the plant capacity to 115 million cubic feet per day to be between $250,000 and $750,000. Great Plains replied to questioning that it appeared reasonable to expect the sulphur plant modifications to be completed by July 1, 1975.

With respect to alternatives to a common processor order, Great Plains stated that it believed unit enlargement to be the best solution for co-operative production of the entire pool but it was unable to agree with Unit No. 1 as to the terms of unitization. Great Plains said that one problem that arose in enlargement negotiations was whether equalization for the Unit No. 2 lands should be based on depreciated costs or original costs. Great Plains's position was that equalization of unit facilities should be at depreciated cost and that the cost to Unit No. 2 if equalization were calculated on original rather than depreciated costs would be approximately 10 per cent of $2 million or approximately $200,000. Great Plains stated that a second barrier to unit enlargement was the matter of which of the wells in the proposed Unit No. 2 would be part of the expanded unit. It proposed to add only the 7-30 well to Unit No. 1 while Unit No. 1 wanted both the 7-30 and the 10-8 well to be added. Great Plains emphasized that it was prepared to submit the 10-8 well to the unit should enlargement become effective immediately. Great Plains stated that the third and possibly the major point of contention was the failure of CanDel to accept an early date for enlargement. It indicated that it had asked for unit enlargement agreements to be in the Crown's hands by July 1, 1974 while Unit No. 1 proposed July 1, 1975. Great Plains claimed the delay was very significant in light of the drainage and loss of current revenue that would take place.

Great Plains indicated that there was no disagreement on the calculation of equities between the units. It stated that both units agreed that equity should be calculated on the basis of the DCQ's with minor modifications for product content value.

On the question of processing its gas at a new gas plant, Great Plains stated that the cost to Great Plains of building a second plant in the Minnehik-Buck Lake field would be higher than participation in the existing plant. Great Plains said that while it had not considered the present cost of such a venture, the cost of a new plant in 1973 was approximately $2.4 million. It stated that such a plant would take about 1 year to put on production from the time that approval was received. Great Plains indicated that it was not prepared to say whether or not it would proceed to build another plant if a common processor order were not granted. Great Plains believed that permission to build a second plant would be refused, since the Board, the Department of the Environment, and the people of the area would prefer that the gas be processed in the existing CanDel Plant.

On the question of processing the gas from Unit No. 2 at another existing gas plant, Great Plains replied that it had not seriously investigated such a possibility. The next nearest gas processing plant is 20 miles from the 10-8 well and Great Plains did not believe it had the capacity to handle Unit No. 2's total contract rate. Therefore Great Plains did not think it would be reasonable to process its gas at an alternative plant.

3.2 Views of CanDel

In its intervention, CanDel stated that the establishment of a common processor order in the Minnehik-Buck Lake field was unnecessary as means existed for the applicant to obtain processing facilities through normal business arrangements. CanDel emphasized that in the past Great Plains had failed to utilize available opportunities to obtain rateable processing facilities by declining enlargement offers from Unit No. 1. CanDel suggested that the Board encourage Great Plains to continue negotiations for enlargement of Unit No. 1 or, alternatively, proceed with plans to construct a separate gas processing plant.

CanDel stated that the significance of the July 1, 1975 date for enlargement was to reduce the risk to the Unit No. 1 owners of exposure to current loss of income. CanDel stated at the hearing that a maximum sales gas revenue loss of $3,700 per day could be incurred by Unit No. 1 if a common processor declaration were made before any plant modifications had been completed. While this would occur when the plant was operating at maximum day conditions, CanDel declined to estimate how often such conditions could occur. CanDel stated that, as it interpreted the common processor order, no difference would exist in the volumes of gas processed either under a single enlarged unit or under a common processor order, provided the effective starting date was the same. However, numerous other difficulties would arise in operating the field under a common processor order. CanDel anticipated that additional plant installations and operating costs could be involved to ensure a rateable take. Under a common processor order the owners of Unit No. 1 would initially have to pay for any additional plant facilities. The owners would recover such costs by levying processing charges over time. In response to questioning CanDel stated that design of a new sulphur plant is underway for the CanDel Plant and that the incremental capital cost of these facilities is currently estimated at $400,000. CanDel estimated the incremental annual operating expenses of the new sulphur plant would be approximately 10 per cent of the capital cost. Expansion plans for other than the sulphur plant had not yet been considered by Unit No. 1.

With regard to unit enlargement, CanDel stated that it had always supported a proposal for unit enlargement. CanDel stated its belief that under the existing conditions it would be far preferable to operate the field under one administration through an enlarged unit. If there were one enlarged unit, any shortfall in plant capacity would be borne rateably between all the owners. CanDel stated that once the sulphur plant modifications had been made to the CanDel Plant, it would be feasible to enlarge the unit and further steps to counteract any processing deficiency could then be made by the expanded unit.

CanDel did not comment on the alternative of Great Plains continuing to process its gas at the CanDel Plant on an available capacity basis except for pointing out that in the recent past the 7-30 well had produced a larger percentage of its nominations than had Unit No. 1. Neither did CanDel comment on whether the two parties might agree that Unit No. 2 gas could be processed on any other basis.

CanDel stated that it considered the building of a new gas plant to process gas from Unit No. 2 to be a feasible alternative to unit enlargement. It did not comment on the feasibility of Unit No. 2 processing its gas at an alternative existing gas plant.

3.3 Views of the Board

The Board believes that two matters are preventing the parties involved from reaching a voluntary agreement for the processing of gas from Unit No. 2: the failure to agree upon the effective date of unit enlargement, and the disagreement about the calculation of equalization between the units. The Board believes these outstanding differences sufficient for it to conclude that a voluntary agreement between the parties was not possible at the time of the hearing. The Board believes that Great Plains has made a reasonable effort to arrange for the processing of its gas in the CanDel Plant and that agreement is not possible without delay to at least mid-1975.

The Board sees four different means of processing the gas from Unit No. 2. One possibility is to utilize the CanDel Plant on a rateable basis either by a future voluntary agreement or through a common processor declaration as proposed by the applicant. The second is to continue the present scheme of processing the gas on an interruptible basis. The third means is a processing arrangement with another existing plant and the final possibility is the construction of a new plant.

In assessing the feasibility of having the subject gas processed at the CanDel Plant, the Board considers that it should assess the impact that a common processor declaration would have on the operation of this plant. The Board accepts CanDel's statement that if the gas from Unit No. 2 were to be processed immediately on an uninterruptible basis, Unit No. 1 could suffer a loss of sales of $3,700 per day at maximum day nominations. However, following a review of production records filed with the Board, the Board has calculated that the average daily sales at the CanDel Plant over the past 6 months have been approximately 80 million cubic per per day compared to the nominal plant capacity of 95 million cubic feet per day and maximum day conditions have not frequently occurred. The Board recognizes that the CanDel Plant has encountered operating difficulties in the past and that to ensure full processing capacity the plant would need to be modified.

In order to measure approximately the economic effect of modifying the CanDel Plant following a possible common processor declaration, the Board estimated the return for such an event. The Board assumed a case of Unit No. 2 supplying all the necessary capital for plant expansion, paying the incremental operating costs, and receiving all the resulting revenues from the sale of Unit No. 2 sales gas and other products. These assumptions and the resulting calculations are for illustration only. From testimony at the hearing the Board estimated the 1975 capital investment required to remove the sulphur plant deficiencies and to de-bottleneck the plant to be approximately $600,000 and the incremental increase in operating costs to be some $60,000 per year escalated at 5 per cent per year. Also an estimated capital expenditure for later field compression facilities would be $150,000, resulting in an additional incremental increase in operating costs of $10,000. Incremental residue gas volumes were assumed to be some 8 million cubic feet per day initially and were assumed to decline to 2 million cubic feet per day at the end of the project in 20 years. Gas prices were estimated as $0.60 per thousand cubic feet at present rising to $2.04 per thousand cubic feet in 1994. The resulting present worth profit to Unit No. 2 over a 20-year life and discounted at 15 per cent was calculated to be in the order of $12 million.

The Board concludes that the gas in question could be accommodated in the CanDel Plant with a relatively low capital investment and a correspondingly low incremental operating cost and that the operation would be attractive to Unit No. 2 from an economic viewpoint. Assuming the appropriate sharing of capital and operating costs there should be no significant adverse impact on CanDel or Unit No. 1 once plant expansion has been completed.

From the environmental viewpoint the effect of a common processor declaration would be no different than a voluntary agreement between the parties for unit enlargement. Like unit enlargement, it would eliminate the necessity for constructing a new plant or additional pipe lines.

The Board also considered the possibility of Great Plains continuing to have its gas processed at the CanDel Plant on an interruptible basis until some agreement can be reached between the parties. Using the past production history of the CanDel Plant and extrapolating into the future, the Board estimated that Unit No. 2 would suffer an average loss of sales of some 4.5 million cubic feet per day by waiting until plant modifications were completed. (The Board recognizes that caution should be exercised in extending past estimates of spare capacity in the CanDel Plant into the future.) The Board does not consider continuation of the interruptible agreement to be a reasonable or reliable alternative for Unit No. 2.

In considering an application for declaration of a common processor, the Board believes it proper to consider the availability of alternate existing plants. The Board notes that there are two sour gas plants located at some distance from Unit No. 2 which could feasibly take the gas. These plants are the Wilson Creek Plant operated by Amerada Minerals Corporation of Canada Ltd. and the Homeglen-Rimbey Plant operated by Gulf Oil Canada Ltd.

The Wilson Creek Plant is 19 miles from Unit No. 2 and would require expansion to process all the gas from Unit No. 2. It also does not recover sulphur and some increase in flaring of acid gas would occur.

The Homeglen-Rimbey Plant processes large volumes of sour gas and the Board believes it would be technically feasible to process Unit No. 2 gas at this plant. However, the plant is 32 miles from Unit No. 2 and at an estimated pipe line cost of $8,000 per inch-mile, a 6-inch pipe line would cost about $1.5 million.

Because the 7-30 well is presently tied into the CanDel gathering system and the 10-8 well is only 1 mile from the CanDel Plant, the Board considers that from a location viewpoint, utilization of the CanDel Plant has significant economic justification over the alternative existing plants. Moreover there would be environmental disadvantages in constructing a 32-mile sour gas pipe line. For these reasons the Board concludes that the processing of Unit No. 2 gas in other processing plants available in the area is not a practical alternative.

Concerning the processing of the gas in the new plant, the Board again assessed the economics of Unit No. 2 building a new plant in a location other than that denied by the Board in 1973. Using the data previously submitted by Great Plains, the Board estimated the capital cost of a 20 million cubic foot per day plant recovering sulphur to be $2.4 million. This plant proposed by Great Plains was somewhat larger than that presently required by Unit No. 2 and included gas production from other sweet and sour wells outside Unit No. 2. The cost of constructing the necessary pipe line was estimated at $200,000. It was also estimated that field compression facilities would be required later on in the project amounting to a capital expenditure of $300,000. The total operating costs for the project were estimated to be some $250,000 per year escalating at 5 per cent per year. From the production rates proposed by Great Plains in its application for this new plant, the Board assumed residue gas volumes would initially be 12 million cubic feet per day declining to 5 million cubic feet per day at the end of the project. The gas prices were assumed to be $0.60 at present increasing to $2.04 in 1994. The Board calculated a present worth profit over a 20-year life discounted at 15 per cent of about $16 million.

The Board performed a second economic analysis for a smaller plant that would process only the gas from within Unit No. 2 and at rates equal to those for gas processed in the CanDel Plant if there were unlimited capacity. The Board estimated that a 10 million cubic foot per day plant could be built with a capital investment of some $1.5 million. The Board assumed initial residue gas volumes of 8 million cubic feet per day declining to 2 million cubic feet per day in 20 years. The same gas prices as the first case were used. The result of this analysis was that the present worth profit of such a project would amount to some $11 million. The Board therefore considers that such an undertaking would be economically attractive.

The Board also considered the environmental aspects of a new plant. As a result of the examiners' hearing held in 1973, the Board is aware that many of the local residents are opposed to a second gas processing plant being built in the area. While Great Plains's application for a new plant was denied without prejudice to a further application for a new plant in another location, the Board concurs with the examiners' conclusions that one large plant would likely have less detrimental effect on the surroundings than would two intermediate size plants in the same general vicinity. The Board also believes that if a new plant were constructed to process gas from Unit No. 2, the sulphur recovery efficiency required by the Board's guidelines would likely be lower than that presently required for the CanDel Plant and would result in higher overall sulphur dioxide emissions.

The Board concludes that while construction of a new gas processing plant is an economically feasible alternative to the applicant, the environmental aspects and reduced economic attractiveness of such a project make it less desirable than the proposed common processor order or a voluntary agreement for processing in the CanDel Plant. The Board therefore will not deny the application on the grounds that construction of a new plant is a reasonable alternative to Unit No. 2.

Recapitulating, the Board concludes that if the subject gas were to be processed at an existing plant, processing it at the CanDel Plant would be the most logical route and would allow the earliest possible marketing of Unit No. 2 gas. The Board considers that while construction of a new plant would be feasible, the same revenue could be generated with less capital investment and lower incremental operating costs by expanding the existing facility. Furthermore the environmental impact would be less if the CanDel Plant processed the gas. On the other hand, the Board recognizes that a common processor declaration would infringe on the freedom of operation of the plant owners and the Board believes that such a declaration should not be made unless it is clearly warranted.

4 DECISION

The Board believes that Great Plains has made every effort to find a reasonable means of processing its gas. It has negotiated with CanDel and attempted to construct a new plant which was not approved by the Board for environmental reasons. In the meantime the applicant is suffering drainage of its gas reserves in the Pekisko A Pool. Accordingly, the Board, with the approval of the Lieutenant Governor in Council, is prepared to issue a common processor order in the form of Appendix A.

5 COMMON CARRIER APPLICATION

5.1 Views of the Applicant

Great Plains stated in its application that the 7-30 well is presently tied into the Unit No. 1 gathering system, and in order for it to continue to use the existing pipe line to deliver gas to the CanDel Plant, Great Plains requested that the gathering system be declared a common carrier. It stated that the 7-30 well would be the only one which would produce gas through the Unit No. 1 gathering system since the 10-8 well would be tied directly into the CanDel Plant. Great Plains indicated that it had not applied to have the 7-25 well sharing in a common gathering system because the well would not be on production for a few years.

5.2 Views of CanDel

CanDel stated that a common carrier declaration would create additional expense for Unit No. 1 in field operations but would not result in any expense for plant operations. CanDel indicated that there would be no difference between the maximum volume of gas currently being transported and that which would be transported under a common carrier declaration.

5.3 Views of the Board

The Board concludes that the Unit No. 1 gathering system is the most economical and desirable route to transport the gas from the 7-30 well to the CanDel Plant. The Board also concludes that since the 7-30 well is presently tied into the Unit No. 1 gathering system, little expense to either party would result from transporting the gas from the 7-30 well following the common processor declaration. For these reasons the Board would be prepared to issue a common carrier declaration if it were necessary. The Board believes however that in light of the common processor declaration the two parties may be able to arrange the details of transporting Unit No. 2 gas to the CanDel Plant.

6 DECISION

The Board defers its decision on the application and requests that Great Plains advise it by March 31, 1975 whether or not it has been able to make satisfactory arrangements for the transportation of Unit No. 2 gas. In the event that Great Plains advises the Board in the affirmative the application for the common carrier declaration shall be deemed to be dismissed. In the alternative, the Board, with the approval of the Lieutenant Governor in Council, would proceed with the issuance of a declaratory order.

ENERGY RESOURCES CONSERVATION BOARD

D. R. Craig
Vice Chairman

February 17, 1975

ATTACHMENT I TO DECISION 75-3

(A) UNIT NO. 1

Working Interest Owner	Per Cent Participation
Amerada Minerals Corporation of Canada Ltd.	10.380
Amoco Canada Petroleum Company Ltd.	2.207
Anglo Canadian Oil Co. (1955) Ltd.	4.338
Bailey Selburn Oil & Gas Ltd.	8.694
Canadian Seaboard Oil Company	1.782
Canadian Superior Oil Ltd.	7.971
CanDel Oil Ltd.	11.667
Great Plains Development Company of Canada Ltd.	10.790
Great Plains Oil & Gas Ltd.	19.679
Gulf Oil Canada Limited	4.194
Hudson's Bay Oil and Gas Company Limited	3.615
Imperial Oil Enterprises Ltd.	0.485
Imperial Oil Limited	7.486
Pacific Petroleums Ltd.	1.782
Sabre Petroleums Ltd.	0.592
Supertest Investments and Petroleum Limited	4.338

(B) PROPOSED UNIT NO. 2

Working Interest Owner	Per Cent Participation
Amoco Canada Petroleum Ltd.	7.653
Bailey Selburn Oil & Gas Ltd.	5.013
Great Plains Development Company of Canada Ltd.	82.853
Pacific Petroleums Ltd.	1.114
Texaco Exploration Canada Ltd.	3.367

Appendix A to Decision 75-3

THE PROVINCE OF ALBERTA

THE OIL AND GAS CONSERVATION ACT

ENERGY RESOURCES CONSERVATION BOARD

ORDER NO. Misc 75XX

An order respecting the
CanDel Minnehik-Buck Lake Gas Processing Plant

WHEREAS the Energy Resources Conservation Board on November 20, 1974, at the City of Calgary, Alberta, publicly heard an application by Great Plains Development Company of Canada, Ltd. for a declaration that the owner or operator of the CanDel Minnehik-Buck Lake Gas Processing Plant be declared a common processor for the Minnehik-Buck Lake Pekisko A Pool; and

WHEREAS the Board finds that the Working Interest Owners of the Minnehik-Buck Lake Unit No. 1 are the owners of the said processing plant; CanDel Oil Ltd. is the operator of the said processing plant; and that the said processing plant processes gas produced from the Minnehik-Buck Lake Pekisko A Pool; and

WHEREAS the Board finds that the order hereinafter made is appropriate in the circumstances.

THEREFORE, the Energy Resources Conservation Board, pursuant to section 54 of The Oil and Gas Conservation Act, being chapter 267 of the Revised Statutes of Alberta, 1970, and the Lieutenant Governor in Council having given his approval by Order in Council dated   , 1975 and numbered O.C.   /75, hereby declares CanDel Oil Ltd., being the operator of the CanDel Minnehik-Buck Lake Gas Processing Plant located on Legal Subdivision 10 of Section 5, Township 46, Range 6, West of the 5th Meridian, to be a common processor of gas from the Minnehik-Buck Lake Pekisko A Pool.

MADE at the City of Calgary, in the Province of Alberta, this _______ day of ____________, 1975.

ENERGY RESOURCES CONSERVATION BOARD

D. R. Craig
Vice Chairman

ENERGY RESOURCES CONSERVATION BOARD

Decision 75-4
Application Nos. 7759 & 7966
(Alberta Power Limited)
Application Nos. 7992 & 7996
(Calgary Power Ltd.)

CONKLIN POWER PLANT AND ELECTRIC DISTRIBUTION SYSTEM

1 INTRODUCTION

1.1 The Application and Hearing

The subject applications were made under sections 7.2, 20 and 23 of The Hydro and Electric Energy Act. Each of the applicant companies requested approval for the construction and operation of a small diesel power plant and an electric distribution system in the Settlement of Conklin, and for an alteration to their service areas to include the Conklin area.

The applications were heard by the Board at Edmonton on November 28, 1974, by V. Millard, J. I. Strong, P.Eng. and G. J. DeSorcy, P.Eng.

1.2 Appearances

The following parties appeared at the hearing:

	Represented by	Witnesses
Alberta Power Limited (Alberta Power)*	J. M. Hope, Q.C.	K. Provost, P.Eng. G. Paicu, P.Eng. C. O. Twa, P.Eng.
Calgary Power Ltd. (Calgary Power)*	H. M. Kay	W. D. Poole, P.Eng. E. W. Smith, P.Eng. D. E. Wright, P.Eng.
Energy Resources Conservation Board staff	A. L. McLarty K. I. Montgomery, P.Eng. D. G. Beamer, C.E.T.	

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* Abbreviation used in this report.

1.3 Background

The Alberta Housing Corporation (Alberta Housing) presently owns and operates a power plant and electric distribution system in the Settlement of Conklin (see Figure 1). The existing plant consists of two diesel-driven single phase 150/230-volt electric generators of 20-kW* and 40-kW capacity.

The existing single phase 120/240-volt electric distribution system presently serves a total of 20 customers including a general store, two Northland School Division buildings, a church, several Alberta Lands and Forests buildings, and 12 houses, 8 of which are owned by Alberta Housing. There are an additional 22 houses and 2 section gang houses (of the Northern Alberta Railroad) located within Section 31, Township 76, Range 7, West of the 4th Meridian, which do not presently have electric service. Approximately one and one-half miles east of Conklin, in Section 33, there are also two fishing lodges located on Christina Lake that are not served from the present Conklin system, but generate their own electric energy using a small generator.

Alberta Power and Calgary Power learned through discussions with the Northern Alberta Electrification Committee (NAEC) of the Department of Telephones and Utilities that, as a result of a number of requests from residents of Conklin for electric service, the existing power plant would not have sufficient capacity to meet these loads and Alberta Housing indicated that it would like to discontinue its operation of the existing system and would prefer to have an established utility operator take over the power plant and electric distribution system.

1.4 Alberta Power Applications

Alberta Power's Application No. 7966 proposed the installation of a power plant containing two 3-phase, 50-kW diesel-driven electric generators. The two units would be individually mounted on steel skids and installed in a suitable sheet metal building which would be constructed for this purpose. Diesel fuel would be used for these units and would be stored in a 10 thousand gallon storage tank to be installed at the site. Alberta Power stated that it would meet all the necessary environmental conditions required by the Alberta Department of the Environment respecting the operation of the power plant.

Alberta Power's Application No. 7759 dealt with the proposed electric distribution system and service area. Alberta Power requested that Sections 31, 32 and 33, Township 76, Range 7, West of the 4th Meridian be added to its service area. It planned to salvage the existing electric distribution system facilities and to construct a new 3-phase, 25-kV** distribution system to serve the existing 20 customers presently served by Alberta Housing. These 20 existing customers are all located within Section 31, Township 76, Range 7, West of the 4th Meridian.

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* 1 kilowatt (kW) = 1000 watts
**1 kilovolt (kV) = 1000 volts

1.5 Calgary Power Applications

Calgary Power's Application No. 7992 proposed the use of the existing wood frame building and the alteration of the existing Alberta Housing power plant by replacement of the existing single-phase 20-kW unit with a single-phase 50-kW diesel-driven electric generator. The existing 40-kW unit would be used as a standby unit. Diesel fuel would be used for the plant and would be stored in an 8 thousand gallon storage tank at the site. Calgary Power stated it would meet all the necessary environmental conditions required by the Alberta Department of the Environment respecting the operation of the power plant.

Calgary Power's Application No. 7996 is for the proposed electric distribution system and for a service area consisting of Section 31, Township 76, Range 7, West of the 4th Meridian. Calgary Power proposed to use most of the existing electric distribution system facilities and to increase the voltage from single phase, 240 volts to single phase, 2,400 volts. This system would serve the existing 20 customers, all of whom are located within Section 31, Township 76, Range 7, West of the 4th Meridian.

2 DEFINITION OF THE ISSUES

The Board notes that a modest system is presently operating and providing service to approximately 20 existing customers in Conklin who will continue to require service. The need for an adequate and economic system has therefore been established. Thus the main issue to be settled is whether Alberta Power or Calgary Power should be granted the necessary approvals for the power plant and the electric distribution system to serve Conklin. In considering this issue the Board has evaluated the applicants' proposals with regard to the following:

(a) the adequacy of the proposed power plant and the electric distribution system, and

(b) the economics of the proposed power plant and the electric distribution system.

3 ADEQUACY OF THE PROPOSED POWER PLANT AND ELECTRIC DISTRIBUTION SYSTEM

3.1 Views of Alberta Power

Alberta Power investigated two alternative means of providing service to Conklin. One possibility which the applicant considered was to construct a 15-kV transmission line from Anzac to Conklin, a distance of approximately 68 miles, at an estimated cost of $425,000 ($6,250 per mile). Alberta Power concluded this alternative was not economically viable at the present time compared with an isolated power plant at Conklin.

Alberta Power planned to install two 50-kW generating units and a 25-kV distribution system which it considered would be adequate in view of the limited load growth it expected in the Conklin area. The applicant stated that the system it proposed would be capable of serving the existing 20 customers plus the 26 potential customers, including the two fishing lodges at Christina Lake. It did not foresee any significant load growth beyond these presently identified loads. Alberta Power submitted that the three-phase generating units and the 25-kV distribution system it proposed have the following advantages over a similar lower voltage single-phase system:

(a) Most diesel generating units of 50-kW capacity or larger are of three-phase design.

(b) The cost of three-phase generators of this size is generally less than similar single-phase units.

(c) In other similar isolated systems three-phase power has been requested shortly after installing the system.

(d) The higher voltage distribution system allows outlying loads to be served more economically.

(e) A 25-kV distribution system is more compatible with the voltages used to connect isolated systems to the provincial electric system.

Alberta Power expressed the view that it had the capability and experience to install, operate and maintain the facilities it proposed since the company had considerable experience with other similar isolated systems. The applicant indicated that at the present time it operated isolated systems at Fox Lake, Jean D'Or Prairie, Fort Chipewyan, Wabasca, and Janvier. With regard to maintaining the system it proposed, Alberta Power stated that at the present time its staff from Fort McMurray carried out regular monthly inspections and maintenance of the Janvier system, approximately 25 miles north of Conklin, and that this staff could also include the proposed Conklin system in its inspection tours. Alberta Power expected to have a local resident act as a part-time attendant for the power plant and advise Alberta Power of any major mechanical or electrical problems which might arise. In the event of the failure of one of the two units the applicant indicated that it would replace the unserviceable unit from its stock of similar-sized units if on-site repairs were not possible.

In summary, Alberta Power stated that in general terms its proposal was in the best interest of the customers because isolated power plants of this nature are and have been a part of its business for a good number of years and it therefore has the operating skills, experience, staff and back-up equipment necessary to provide the service. The applicant further stated that because of its operating base in Fort McMurray it could easily and economically serve the Conklin operation. The applicant also considered that its historical presence and its other plants in the general area of Conklin should give it some preference respecting this application.

3.2 Views of Calgary Power

Calgary Power also considered the alternative of a transmission line from the provincial electric system to serve Conklin. Its estimate of the cost to build a 15-kV line north from Lac La Biche, a distance of some 80 miles, was $1.2 million ($15,000 per mile) and Calgary Power therefore did not consider this a feasible alternative to a power plant at Conklin.

The applicant stated that its proposed power plant and electric distribution system would be adequate to provide service to the existing 20 customers and also the 24 potential customers located in Section 31, but that the existing 40-kW unit would likely have to be replaced with a larger unit in order to meet the expected peak load if all of these potential customers desired electric service. Calgary Power stated that it was not aware that the two fishing lodges on Christina Lake had requested service but that electric service to Christina Lake could be provided but it would involve a capital contribution from the fishing lodges considering the length of line required to serve the relatively small load.

Calgary Power stated that it proposed to replace the existing 20-kW single-phase unit with a 50-kW single-phase unit and to install a 2,400-volt electric distribution system for the following reasons:

(a) The existing 20-kW standby unit could not handle the total present load at Conklin continuously; therefore, a new 50-kW unit would be installed as the operating unit and the existing 40-kW unit would be kept in reserve as a standby unit.

(b) Discussions with the Alberta Department of Industry and Commerce, Alberta Metis Association, and Alberta Housing indicated that future load growth in the area was expected to be minimal and therefore three-phase electric energy would not likely be required.

(c) The vast majority of hamlets, villages, and rural subdivisions served by Calgary Power are supplied using a single-phase system and Conklin does not differ from these smaller systems to any extent.

(d) The cost of installing a single-phase distribution system would be less than that of a three-phase system.

Calgary Power expressed the view that it has the necessary expertise in the operation of isolated power systems to serve Conklin since the company operated similar systems at Robb, Cache Creek, Calling Lake and Athabasca for short periods of time prior to these communities being connected to the provincial electric system. Calgary Power stated that it would train a local resident of Conklin to operate the power plant on a part-time basis and Calgary Power staff would make regular inspection and maintenance trips to Conklin on a bi-monthly basis.

In summary Calgary Power maintained that its proposal could adequately provide electric service to Conklin and that it had sufficient experience with isolated systems of this type to operate and maintain the system it proposed. Calgary Power also pointed out that it owns about two-thirds of the provincial interconnected electric system which it felt would eventually play a vital part in providing electric service to northern communities. Calgary Power felt that this fact should be considered and its applications to serve Conklin should be granted.

3.3 Views of the Board

With respect to serving Conklin with a transmission line, the Board notes the remarkable difference in the per mile cost between the two applicants' estimates of building a transmission line of 15-kV construction from the interconnected system to Conklin. Nevertheless, the Board is in agreement with both applicants that for such a relatively small load a transmission line is not an economically feasible alternative to a small isolated power plant. The Board also believes that a properly maintained isolated power plant in this situation could provide a marginally better degree of reliability than a long transmission line.

In comparing the size of the generating units and the single-phase versus the three-phase distribution system proposed by the respective applicants, the Board believes that from an engineering standpoint both systems could provide adequate reliability and quality of service for the existing and expected potential customers located in Sections 31 and 33 if such a service area was granted. The Board notes that the 25-kV system proposed by Alberta Power would have some advantage over a 2,400-volt system if additional outlying loads of a significant size were to develop and the power plant capacity were increased accordingly. However, based on the available load growth information presented by both applicants, and upon further investigation by the Board, the possibility of additional loads developing in the area which would require three-phase power appears minimal.

In assessing the single-phase and three-phase power plants proposed by the respective applicants, the Board notes that Calgary Power's generating units would not be completely interchangeable, whereas the units proposed by

Alberta Power would be identical and interchangeable. In addition, the Board recognizes that Alberta Power plans an inventory of spare units, some of which may be suitable as temporary replacement units in the Conklin power plant.

The Board is aware of the historical background of both Alberta Power and Calgary Power with respect to their development of both the interconnected and isolated provincial electric system, and of their desire to serve new areas. The Board notes that Alberta Power has considerable experience in the operation of small isolated power plant systems and is now operating approximately 20 isolated systems. The Board believes, however, that even though Calgary Power does not presently operate any isolated power plant and distribution systems, and for this reason has not established an inventory of diesel-driven generators, Calgary Power would be capable of operating a small isolated power plant and distribution system since it has done so in the past. While each applicant has presented somewhat different plans to provide for regular and emergency maintenance of the power plant, the Board is satisfied that either applicant would provide the necessary maintenance to ensure the best level of service possible to the Conklin community. The Board accepts each of the applicants' plans to have a local resident act as a part-time attendant for the plant but believes that more than one person should be made familiar with the operation of the plant and distribution system and should be trained in first aid in case of an accident.

The Board is aware that the two fishing lodges located on Christina Lake are potential customers but expects that the extension of the distribution system to these lodges would be quite costly. Therefore until such time as the fishing lodges actually request electric service from the operator that will be serving Conklin, the Board does not believe that Sections 32 and 33 should be included in the Conklin service area. An application to the Board for approval to serve these lodges would be considered on its merits and on the economic feasibility of extending the Conklin distribution system.

4 ECONOMICS OF THE PROPOSED POWER PLANT AND DISTRIBUTION SYSTEM

4.1 Views of Alberta Power

Alberta Power estimated that the total capital cost of its proposed power plant and distribution system, as estimated in 1974, would be about $31,000. The cost of the power plant consisting of two new three-phase 50-kW diesel-driven generating sets, installing these units in a new metal building and providing a 10 thousand gallon storage tank was estimated to be approximately $24,000. Alberta Power did not propose to use either of the existing units since they are single-phase units and not compatible with the distribution system it proposed. Alberta Power stated that the cost to upgrade the existing single-phase distribution system from a 120/240-volt single-phase system to a 25-kV three-phase distribution system would be about $8,200. The applicant indicated that most of the present distribution system would be salvaged and the net capital cost for the proposed changes in the distribution system would then be some $7,300.

Alberta Power submitted that the operating and maintenance costs for the system it proposed, exclusive of fuel for the power plant, would be $4,000 per year based on generating 100,000 kilowatt-hours of electric energy during a 12-month period. The applicant explained that this cost was an average based on its past experience and allowed for major overhauls of the generating units about every 4 years. It also included part-time supervision and minor maintenance of the power plant, routine repairs on the distribution system and regular monthly inspections of both the power plant and the distribution system. In addition diesel fuel for the plant was estimated to cost 40 cents per gallon delivered, and based on an annual electric energy consumption of 100,000 kilowatt-hours the total fuel cost would be $4,000 per year.

Alberta Power estimated that the system it proposed would have an economic life of 15 years or so. The applicant's analysis indicated that the total annual cost of owning and operating the system it proposed would be about $13,200 per year exclusive of taxes.

4.2 Views of Calgary Power

Calgary Power estimated the total capital cost of the power plant and distribution system it proposed as approximately $23,200, as of 1974. It planned to use the existing 40-kW unit and the existing building and to install a new single-phase 50-kW diesel-driven generating set and an 8 thousand gallon storage tank at a total cost of $16,400. Calgary Power planned to make use of most of the existing distribution system and quoted a capital cost of approximately $6,800 to change the existing single-phase 120/240-volt distribution system to a 2,400-volt single-phase system.

Calgary Power stated that the costs of operating and maintaining the system it proposes, exclusive of power plant fuel, would be about $9,000 per year. This figure is made up of the labour and material costs for part-time supervision of the power plant, maintenance of the power plant and distribution system, allowance for major overhauls of the generating units, and the cost of trips to Conklin to carry out maintenance and repairs. Calgary Power assumed the delivered cost of diesel fuel to be about 47 cents per gallon and estimated the annual fuel cost to be $6,000 to generate 61,000 kilowatt-hours of electric energy.

Calgary Power pointed out that its economic analysis of the Conklin system and specifically the power plant, justified an economic life of 25 years and its analysis indicated that the total annual cost of its system, including the cost of capital, depreciation, and operating expenses would be about $18,140.

4.3 Views of the Board

The Board recognizes that the estimates supplied by the applicants were for their respective proposals which involved physically different facilities. However, after careful examination the Board could not reconcile the differences between the two estimates and concludes that these estimates were prepared on different bases and therefore do not reflect the relative capital costs of each of the proposals. The Board has made its own estimate based on evidence presented at the hearing and investigations made subsequent to the hearing. These estimates are summarized in Table 1. The Board's cost estimates do not include the cost of the present Conklin system which the Board assumes would be the same for either applicant. Furthermore, the Board has made no allowance for conducting any environmental studies as may be required by the Department of the Environment but expects the costs for any such work would be the same for either Calgary Power or Alberta Power.

Based on information obtained from equipment supply companies the Board estimates that the cost of the 50-kW diesel-driven generating unit and an 8 thousand gallon storage tank installed at Conklin as proposed by Calgary Power, would be some $16,500 whereas the cost of the two 50-kW diesel generating units, a power plant building, and a 10 thousand gallon storage tank proposed by Alberta Power would be some $26,800.

The Board experienced some difficulty in estimating the cost of the distribution systems proposed by each applicant, but since the Calgary Power plan would use most of the existing system while the Alberta Power plan would construct a completely new system, the Board is satisfied that the Alberta Power proposal would be significantly more costly notwithstanding its plan to salvage material from the existing system. Based on information available to it, the Board is satisfied that the estimate of $6,800 for the modifications proposed by Calgary Power is reasonable whereas the net cost (after salvage) of the new system proposed by Alberta Power is estimated to be some $10,600.

The total capital costs of the respective proposals are estimated by the Board to be $23,300 for Calgary Power and $37,400 for Alberta Power. The Board believes it reasonable to assume a twenty-year life for the assets and a long-term interest rate of 10 per cent per annum. Based on these assumptions the annual cost of depreciation and capital is some $2,720 for Calgary Power and $4,380 for Alberta Power.

The estimated annual operating costs of the two applicants differed considerably. In the Board's view this difference is not reasonable and simply reflects the different methods employed in making the estimates. The Board has considered each of the components of operating costs to identify those which might reasonably be expected to yield different costs for the two applicants. The Board agrees with Alberta Power that because of location it could provide maintenance service to Conklin somewhat more economically than could Calgary Power and estimates the annual saving at some $600. On the other hand the Board agrees that the Calgary Power estimate of annual operating and maintenance costs exclusive of fuel, is more comprehensive than Alberta Power's estimate. The Board, therefore, has accepted the Calgary Power estimate and, in estimating the annual operating and maintenance costs for Alberta Power, has subtracted the $600 saving from the Calgary Power estimate.

The Board does not believe that there would be any significant difference in the actual costs that each applicant would encounter with respect to equipment overhauls or fuel requirements. The Board estimates that the allowance for overhauls would be some $1,500 per year for each proposal. The Board also estimates the annual fuel cost at $4,800 for either proposal based on the assumptions that some 85,000 kilowatt-hours would be generated per year and diesel fuel would cost $0.50 per gallon.

The total annual operating costs estimated by the Board are $16,120 for the Calgary Power proposal and $17,180 for the Alberta Power proposal, thus representing a difference of some 7 per cent. The Board recognizes that actual construction and operating costs of either proposal may well vary by much more than the 7 per cent difference estimated by the Board. However, regardless of the absolute level of those costs, in the Board's view it is clear that the Calgary Power proposal could be constructed and operated at somewhat lower costs than that of Alberta Power.

5 FINDINGS OF THE BOARD

The Board sees very little difference between the applications of Calgary Power and Alberta Power. Each proposal would adequately satisfy the existing and anticipated requirements of the Settlement of Conklin and the immediate area and would provide comparable service. The Alberta Power proposal offers more potential for long-term load growth in the general area but since there is no evidence of future development the Board believes only marginal weight should be given to this advantage.

The costs as estimated by the Board for each applicant are very close but the Board is satisfied that the Calgary Power plan would require a lower capital investment and somewhat lower total annual costs.

The Board therefore believes that the real advantage in costs, although small, credited to the Calgary Power proposal, outweigh the potential advantage of the additional capacity for future growth offered by the Alberta Power proposal.

6 MINISTERIAL APPROVAL

The Hydro and Electric Energy Act, section 7.2, subsection (3), provides that

(3) Prior to the Board approving the construction and operation of the power plant, it shall refer the application to the Minister of the Environment for his approval of the application as it affects matters of the environment.

The Board in compliance with the above section has referred the application to the Minister of the Environment for his approval of the application as it affects matters of the environment. Any approval given by the Minister will be incorporated into any approval given by the Board, and any Board approval will be subject to any conditions imposed by the Minister with respect to matters of the environment.

7 DECISION

Having regard for its responsibilities under The Hydro and Electric Energy Act the Board is prepared, subject to the approval of the Minister of the Environment with respect to matters affecting the environment, to issue an approval to Calgary Power Ltd. for the construction and operation of a power plant and an electric distribution system at Conklin.

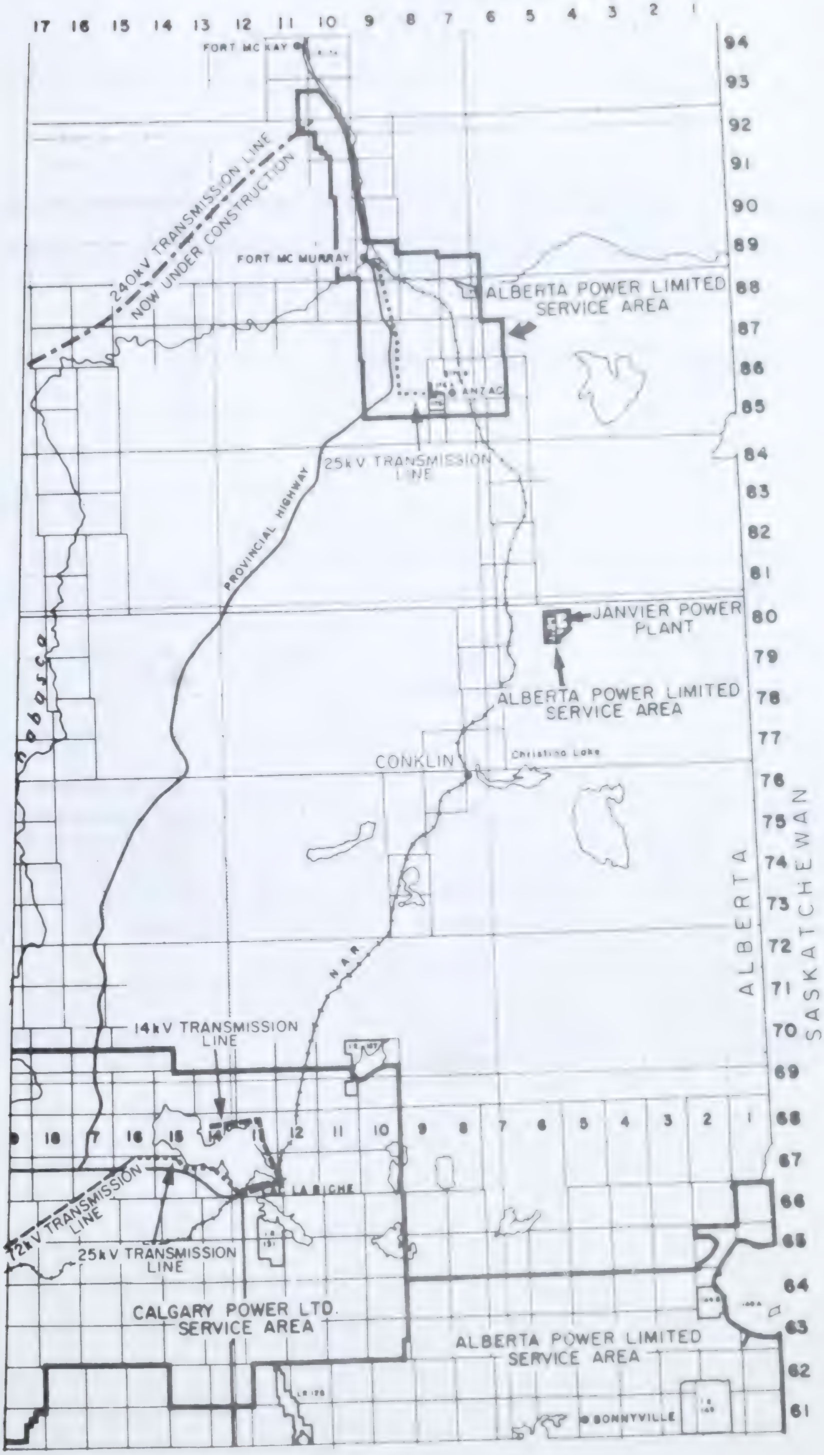
The approval would be in the form set out in Appendix A and subject to the terms and conditions therein contained.

ENERGY RESOURCES CONSERVATION BOARD

Vernon Millard

Vernon Millard
Vice Chairman

February 24, 1975.



ALBERTA POWER LIMITED AND CALGARY POWER LTD.
SERVICE AREAS IN THE NORTHEASTERN PORTION OF THE PROVINCE

FIGURE 1

ENERGY RESOURCES CONSERVATION B
CALGARY, ALBERTA

TABLE 1

COSTS AS ESTIMATED BY THE BOARD FOR THE ALBERTA POWER AND CALGARY POWER PROPOSALS FOR A POWER PLANT AND ELECTRIC DISTRIBUTION SYSTEM FOR CONKLIN

(DOLLARS)

ITEM	CALGARY POWER	ALBERTA POWER
Capital Costs:		
Power Plant	16,500	26,800
Distribution System	6,800	10,600
Total Capital Cost	23,300	37,400
Annual Costs:		
Cost of Capital and Depreciation (20 year life 10% interest)	2,720	4,380
Operation and Maintenance	7,100	6,500
Allowance for Overhauls	1,500	1,500
Fuel	4,800	4,800
Total Annual Cost	16,120	17,180

APPENDIX A FORM OF APPROVALS

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of the
Conklin Power Plant of
Calgary Power Ltd.

APPROVAL NO. HE 7503

WHEREAS the Energy Resources Conservation Board is prepared to grant an application by Calgary Power Ltd., for approval of the construction and operation of a power plant, subject to the conditions herein contained and the Minister of the Environment having given his approval hereto attached, insofar as the application affects matters of the environment.

THEREFORE, the Energy Resources Conservation Board, pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta 1971, hereby orders as follows:

1. The construction and operation by Calgary Power Ltd. (hereinafter called "the Operator") of a 90-kW power plant located in the Northwest quarter of Section 31, Township 76, Range 7, West of the 4th Meridian, is approved subject to the terms and conditions herein contained.

2. Subject to the other provisions of this Approval, the power plant shall be in accordance with an application by Calgary Power Ltd. to the Energy Resources Conservation Board dated August 16, 1974, and evidence given in support of the application at a hearing on November 28, 1974.

3. This Approval, insofar as it pertains to matters of the environment, is subject to the approval of the Minister of the Environment, attached hereto as Appendix A, and to the terms and conditions therein contained.

4. The Board at any time,

   a) upon its own motion, or

   b) upon the application of an interested person,

may vary the terms and conditions hereof or rescind this approval.

MADE at the City of Calgary, in the Province of Alberta, this
day of , 1975.

ENERGY RESOURCES CONSERVATION BOARD

Vernon Millard
Vice Chairman

APPENDIX A TO APPROVAL NO. HE 7503

Department of the Environment

MINISTERIAL APPROVAL

No. ERCB

Edmonton, Alberta

Pursuant to section 7.2 of The Hydro and Electric Energy Act, I William J. Yurko, Minister of the Environment, hereby approve Application No. 7992, dated August 16, 1974, from Calgary Power Ltd. to the Energy Resources Conservation Board, in the matter of a 90-kW power plant in the Settlement of Conklin, insofar as it affects matters of the environment.

MINISTER OF THE ENVIRONMENT

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of the electric
distribution system of Calgary
Power Ltd. in the Conklin Area

APPROVAL NO. HE 7504

The Energy Resources Conservation Board, pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta 1971, hereby orders as follows:

1. The construction and operation of a 2,400-volt electric distribution system by Calgary Power Ltd., within the service area referred to in clause 3 hereof is approved.

2. Subject to the other provisions of this Approval the distribution system shall be in accordance with an application by Calgary Power Ltd. to the Energy Resources Conservation Board dated August 15, 1974, and evidence given in support of the application at a hearing on November 28, 1974.

3. The service area for the electric distribution system is the area shown outlined on the attachment hereto, marked Appendix A to this approval.

4. The Board at any time,

   a) upon its own motion, or

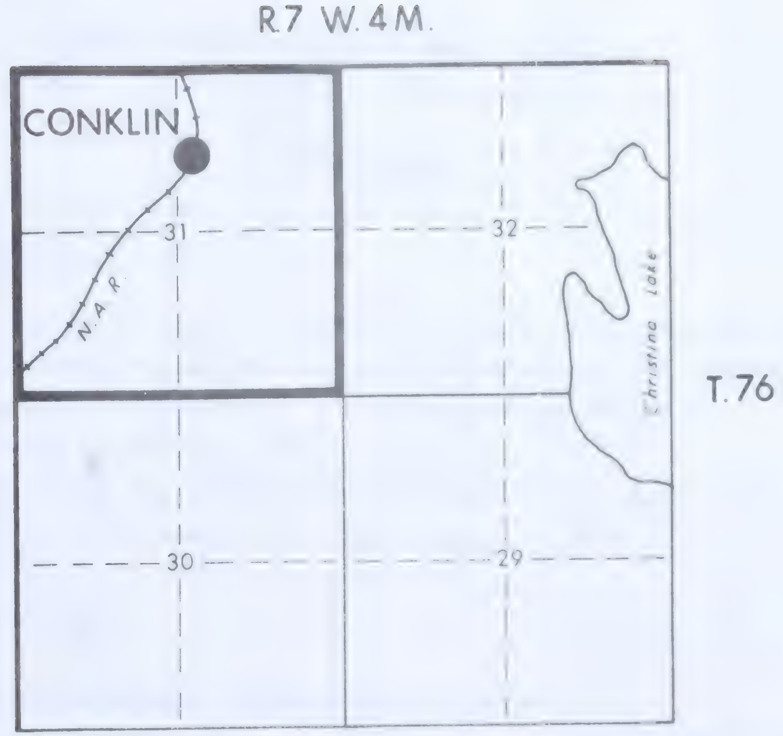
   b) upon the application of an interested person,

may vary the terms and conditions hereof or rescind this approval.

MADE at the City of Calgary, in the Province of Alberta, this day of , 1975.

ENERGY RESOURCES CONSERVATION BOARD

Vernon Millard
Vice Chairman



APPENDIX A TO APPROVAL NO. HE 7504

▬ CALGARY POWER LTD. CONKLIN SERVICE AREA

ENERGY RESOURCES CONSERVATION BOARD

Decision 75-5
Proceeding No. 8204

ANNUAL RESERVES AND MAXIMUM RATE LIMITATIONS FOR OIL POOLS

1 INTRODUCTION

1.1 The Hearing

A hearing was held by examiners appointed by the Board for the purpose of hearing representations respecting the crude oil reserves and maximum rate limitations for pools listed in the Notice of Hearing, issued December 19, 1974.

The hearing was conducted by J.A. Bray, P.Eng., R.G. Evans, P.Eng., and G.H. Stafford, P.Geol., on January 27, 1975.

1.2 Appearances

The following were represented at the hearing:

	Represented by
Aquitaine Company of Canada Limited (Aquitaine)*	A.D. Bradshaw, P.Eng. O. Guillon R.D. Waymouth, P.Eng.
Canadians for Responsible Northern Development	G.F. Paschen
Monsanto Oils Limited (Monsanto)*	C.M. Warke, P.Eng. T.H. Maginley
Board Staff	H. Antonio, P.Eng. D.H. Burger, P.Eng.

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* Abbreviation used in this report.

1.3 Report Content and Terminology

1.31 Content of Report

1 INTRODUCTION
2 TURIN LOWER MANNVILLE B POOL
3 TURIN LOWER MANNVILLE C POOL
4 RAINBOW KEG RIVER B POOL
5 RAINBOW SOUTH KEG RIVER G POOL
6 TEHZE KEG RIVER A POOL
7 SUMMARY OF RECOMMENDATIONS OF EXAMINERS
8 DECISION

1.32 Abbreviations, Terminology and Definitions

1.321 Reserves Terminology

The terms used in this report are consistent with those used in the Board's report "Reserves of Crude Oil, Gas, Natural Gas Liquids and Sulphur, Province of Alberta - ERCB 74-18".

1.322 Abbreviations

The abbreviations used in this report have the following meaning:

2-D	two dimensional
3-D	three dimensional
Bopd	barrels of oil per day
ft	feet
frac	fraction
md	millidarcies
MRL	maximum rate limitation
N	initial oil in place
PRL	preliminary rate limitation

Ri	recovery factor
RiN	recoverable reserves
stb	stock tank barrel
TDT	Thermal Decay Time
WOR	water-oil ratio

1.323 K Factor

The term K factor is used in the report and has the meaning as defined in the PRL formula:

$$PRL = K \times 10^{-6} \quad (U - \tfrac{1}{2}P)$$

Where:

PRL = preliminary rate limitation, barrels of oil per month

K = factor ranging from 7,000 to 11,000

U = recoverable crude oil reserves, stb

P = cumulative crude oil production, stb

1.324 Pool Names

For purposes of brevity, pool names are written out in full at the heading of each section and thereafter are abbreviated. For example, where "Turin Lower Mannville B Pool" is the full name, in the text it is simply the "B Pool".

1.325 Well Names

In this report the terms Legal Subdivision, Section, Township, and Range are used to denote a well location. For example, "the 6-34-10-18 well" or "the well in 6-34-10-18" denotes the well located in Legal Subdivision 6, Section 34, Township 10, Range 18. The meridian involved is obvious from the location of pools under consideration.

2 TURIN LOWER MANNVILLE B POOL

2.1 Reserves

2.11 Views of Monsanto

The Lower Mannville B Pool produces from the Basal Quartz No. 2 sandstone, one of a series of three Basal Quartz sandstones developed in the area. Monsanto considers the B Pool to be separated from the C Pool because of different oil-water contacts and a probable erosion channel between the pools. The oil accumulation is overlain by a small gas cap with a gas-oil contact at -718 feet subsea.

By planimetering a net porous sand isopach map of the B Pool Monsanto estimated the oil zone rock volume within the Board's designated pool area to be 5,857 acre-feet. Using the rock volume within the designated pool area, average porosity of 0.22, connate water saturation of 0.32 and shrinkage factor of 0.85, Monsanto calculated the oil in place to be 5,778 thousand stb. Monsanto indicated that reservoir studies were not undertaken to confirm the proposed 10 per cent recovery factor.

2.12 Views of Examiners

The examiners agree with Monsanto's interpretation of the separation of the B and C Pool oil accumulations, but disagree with Monsanto's interpretation of the areal extent of the B Pool to the south-east. The examiners are of the opinion that the Basal Quartz No. 2 sandstone in the 6-34-10-18 well is structurally low and wet and not part of the B Pool. Additional differences in interpretation result from the examiners' estimates of thinner oil pays and less optimistic isopaching of the pool. Monsanto's method of estimating the rock volume, by planimetering a net porous sand isopach map rather than a net oil pay map, is believed by the examiners to be in error. This method will result in a high estimate, because it incorrectly includes, as oil zone rock volume, the wedge of aquifer underlying the edges of the oil zone. All of these differences result in a smaller oil zone rock volume than that submitted by Monsanto.

The examiners consider the determination of porosity, water saturation and shrinkage factor to be interpretive because of the very limited source data. The examiners recommend adoption of the following reserves factors:

rock volume (acre-ft)	1200
porosity (frac)	0.18
water saturation (frac)	0.32
shrinkage factor (frac)	0.85

Based on the foregoing, the examiners recommend assigning the following reserves values for the B Pool:

N (thousand stb)	969
Ri (frac)	0.10
RiN (thousand stb)	97

2.2 Maximum Rate Limitation

2.21 Views of Monsanto

Monsanto proposed that the maximum rate limitation for the B Pool be based on the PRL formula using a K factor of 7,000.

2.22 Views of Examiners

The examiners agree with Monsanto that the maximum rate limitation should be based on the PRL formula with a K factor of 7,000. This results in an MRL of 23 Bopd.

3 TURIN LOWER MANNVILLE C POOL

3.1 Reserves

3.11 Views of Monsanto

Monsanto also interprets the C Pool to be producing from the Basal Quartz No. 2 sandstone. Monsanto estimated the oil zone rock volume of the C Pool to be 5,651 acre-feet within the Board's designated pool boundary.

The oil zone is overlain by a small gas cap with a gas-oil contact at -727 feet subsea. Monsanto indicated on its isopach map that the well in 10-4-11-18 has 11 feet of net pay. In answer to questions regarding the well, Monsanto indicated that it contains 7 feet of gas pay and 4 feet of oil pay.

Monsanto determined the pool's porosity and water saturation from logs. The porosity was obtained by weighting the average porosity of each well. Although a core was taken from the 6-3-11-18 well, Monsanto did not use the core to assist in correlating the porosity from the logs. Monsanto stated that there are only two or three usable samples in the analysis and they indicate porosities of 0.28, which is significantly higher than the log average porosity of 0.19.

Monsanto calculated an oil in place of 4,815 thousand stb and recoverable reserves of 482 thousand stb for the C Pool. Monsanto indicated it did not attempt any studies to verify the 10 per cent recovery factor.

3.12 Views of Examiners

The examiners are of the opinion that Monsanto's method of isopaching net porous sand rather than net oil pay to determine the rock volume results in an optimistic estimate of oil in place for the C Pool.

Having regard for the above, the examiners recommend adoption of the following parameters for the C Pool:

rock volume (acre-ft)	1775
porosity (frac)	0.18
water saturation (frac)	0.32
shrinkage factor (frac)	0.85

The examiners believe that there are insufficient data to predict recovery performance for the pool, and therefore recommend continuance of the established 10 per cent recovery factor for the pool. The recommended reserves are as follows:

N (thousand stb)	1430
Ri (frac)	0.10
RiN (thousand stb)	143

3.2 Maximum Rate Limitation

3.21 Views of Monsanto

Monsanto proposed that the MRL for the C Pool be based on the PRL formula with a K factor of 7,000.

3.22 Views of Examiners

The examiners agree with the proposal of Monsanto. The resulting MRL is 33 Bopd.

4 RAINBOW KEG RIVER B POOL

4.1 Reserves

4.11 Views of Aquitaine

Aquitaine estimated the recoverable reserves of the B Pool to be 184,000 thousand stb. The reserves estimate was based on the currently assigned oil in place of 260,000 thousand stb, and a recovery factor of 0.71. This estimate of recovery factor was based on a residual oil saturation of 0.25 and connate water saturation of 0.13. No provision was made for sandwich or coning loss.

In determining the residual oil saturation, Aquitaine studied the performance of the pool by means of a two-dimensional two-phase (oil and water) numerical model using the vertical equilibrium assumption and incorporating a coning correlation model in the production subroutine. The areal model is defined by a 37 x 23 grid system consisting of 10-acre cells. The effects of the Rainbow Keg River D, D and EEE Pools, which are in hydraulic communication with the B Pool, were simulated by representing these three pools by aquifer volumes which would have the same compressibility as the three oil accumulations. Aquitaine stated at the hearing that the use of a 2-D areal model with the vertical equilibrium assumption rather than a 3-D model was justified by the presence of a relatively small transition zone in the reservoir at initial conditions. From comparative studies, Aquitaine concluded that the water coning characteristics of the individual wells can be satisfactorily simulated with either a radial coning model or a correlation coning model. However, the latter model is simpler, requires shorter computing time and less storage, and is therefore more economic to use.

Aquitaine used the model to match pressure and water-oil ratio history and the advance of the oil-water interface in the pool.

Aquitaine ran Thermal Decay Time (TDT) logs on several wells in November 1972, June 1973 and June 1974, to monitor oil-water interface movement in the B Pool. At the hearing, Aquitaine acknowledged that numerous factors influence TDT log measurement of oil-water interfaces. Estimation of the position of the oil-water interface was also complicated by the presence of a fairly thick transition zone. Aquitaine defined the "most probable" elevation of the interface as the elevation where the volume of the mobile water above the oil-water contact appeared to be equal to the displaceable oil volume below the oil-water contact. The estimated most probable interface elevations varied significantly from well to well. As a result the rise in the oil-water contact, from pool discovery to June 1974, apparently varied from 20 to 62 feet at the wells which were surveyed.

Aquitaine used the composite model to calculate the rise of the oil-water contact at each well for several different values of residual oil saturation. By comparing the predicted interface rises with the measured rises during the three periods, and having regard for the material balance results from the model, Aquitaine concluded that the most reasonable estimate of the residual oil saturation is 0.25.

Aquitaine considered the composite reservoir and well model to be adequate for predicting the reservoir and well performance because a good pressure history and WOR match was obtained. However, in order to obtain a reasonable match of the rise in oil-water interface, the model was altered such that 10 million reservoir barrels of oil were transferred from the north end to the south end of the pool, all permeabilities were increased by a factor of 2, and the transmissibilities in the north end and in the east end of the pool were increased by a factor of 1.5. Aquitaine stated that the adjustments were necessary to take into account the uneven advance of water in different parts of the pool.

4.12 Views of Examiners

The examiners question whether Aquitaine's adjustments in oil distribution, in permeabilities and in transmissibilities provide for a unique match of the performance parameters of the pool. Further in this regard, the examiners question whether the composite model is sufficiently detailed to describe the historical rise in the oil-water interface at each well. For example, the model indicates that the oil-water interface at the wells rises continuously, whereas TDT log measurements in the 13-2, 1-3 and 3-10-109-8 wells indicate little or no movement in the oil-water interfaces at these wells between June 1973 and June 1974. The examiners are of the opinion that the oil-water interface history match presented in the study does not support very conclusively that a residual oil saturation of 0.25 was the most representative value.

A review of the input data for the 2-D model supplied by Aquitaine after the hearing indicates that permeabilities throughout the model range from 600 to 3700 millidarcies. The permeability thickness ranges from 60,000 md-feet to 2,500,000 md-feet. The examiners are of the opinion that transmissibilities of this magnitude would significantly reduce the sensitivity of the model to measure water coning and therefore the incorporation of the coning correlation model in the 2-D areal model has little or no effect on the interface advance results of the 2-D model.

The examiners are of the view that the composite 2-D areal and coning correlation models are not adequate for purposes of predicting the combination of interface advance and coning behaviour of the wells in the pool and give only an approximation of the final residual oil saturation. However, the model does provide an indication of the variation in well performance and could be useful as a future operations analysis model.

The examiners did not attempt to simulate the reservoir performance by the use of a mathematical model, but did attempt to evaluate the residual oil saturation for the water swept zone using production data and interface measurements. It is noted that the lateral extent of the pool, the porosity of the swept zone and the level picked for the oil-water interface have a significant effect on the final results. For example, a difference of 2 to 3 feet in positioning the interface may result in a 4 to 5 percentile difference in the residual oil saturation. Aquitaine has based its interpretation of the areal extent of the reef on seismic data, but this is subject to uncertainties. The only information which is available to the examiners for determining the position of the reef edges are the data from the well in 4-15-109-8.

Having regard for all the evidence provided, for the performance shown and for the probability of substantial oil recovery from lower quality portions of the pool by gravity and imbibition, the examiners recommend that a residual oil saturation of 0.30 be adopted.

While Aquitaine assumed a 100 per cent sweep efficiency and no sandwich loss, it is the examiners' opinion that, in view of the geometry of the pool and the presence of low porosity and permeability regions, some allowances for sandwich and volumetric conformance losses must be made. The examiners have reviewed the factors previously assigned to the B Pool to account for these losses. They note that in the July 24, 1967 Report of Examiners concerning Application No. 3493 for approval to water flood the Rainbow Keg River B Pool, a volumetric sweep efficiency of 0.95 including the effect of the sandwich was recommended. However, in the Board's Decision 69-1, approving enhanced recovery for the pools in Integrated Scheme No. 1, which includes the B Pool, the Board adopted a conformance factor of 0.95 for the good quality pools in the scheme and a sandwich loss thickness of 15 feet at the crest of each pool subject to water flood. The B Pool was not specifically discussed in Decision 69-1. The examiners find that a final oil sandwich, 15 feet thick at the top of the structure of the B Pool, results in a negligible sandwich loss of 0.02 per cent of the original oil in place. The examiners conclude that, for the B Pool, the effect of the sandwich can be included in the volumetric conformance factor of 0.95. After providing for such losses, the examiners conclude that a recovery factor of 0.62 is appropriate and should be adopted.

Therefore, the following reserves are recommended:

N (thousand stb)	260,000
Ri (frac)	0.62
RiN (thousand stb)	161,000

5 RAINBOW SOUTH KEG RIVER G POOL

5.1 Maximum Rate Limitation

5.11 Views of Aquitaine

Aquitaine proposed that an MRL of 3,730 Bopd be assigned to the G Pool. This MRL is based on the Board's established recoverable reserves of 11,400 thousand stb and a K factor of 11,000. Aquitaine maintains that the present MRL of 480 Bopd was established by the Board on November 1, 1973 in recognition of the period of low production during 1973. It believes that the subsisting low MRL is not representative of the pool's true productivity or of the ultimate reserves recognized for the pool. The total life of the pool under the subsisting MRL would be 62.8 years.

Aquitaine submits that its new well in 14-1-108-10, which it had finished drilling at the end of December 1974, would replace the well in 4-12-108-10. Aquitaine estimated that, based on the performance of other Rainbow wells, the new well's capability would be in the order of 2,000 Bopd. This would increase the pool's productive capacity to a value approaching 3,000 Bopd.

Aquitaine indicated that the pool's current productive capacity is low. It attributes the water production from the 12-1-108-10 well to be the result of its structurally low flank position. Aquitaine further noted that the poor performance of the 4-12 well was related partly to lithology as a result of the well's location in the pool, and partly to its completion.

In answer to questions regarding the appropriateness of the proposed K factor of 11,000, Aquitaine replied that it did not have any particular justification for choosing 11,000 as opposed to 7,000 or 9,000. When asked about the effects of coning at the requested MRL, Aquitaine indicated that the higher rates would increase the tendency towards coning and cause higher rates of water production, but does not believe this would have a serious effect on the final recovery.

5.12 Views of Examiners

The examiners note that the pool's current capability is significantly lower than the requested MRL of 3,730 Bopd and that the productive well in the pool has incurred some water problems. The pool has limited productivity from the existing wells, and this was the basis for the presently assigned MRL. The examiners have concern as to the yet to be proven productive capability of the new well.

The examiners believe that the MRL assigned to this pool should permit reasonable rates of production without adversely affecting ultimate oil recovery. Although the pool has indicated limited productivity with the existing drainage points, the completion of the new well is expected to increase the productivity to a level which would permit the production of the reserves in a shorter time. In that circumstance, the examiners would agree that the existing MRL, which permits a minimum pool life of some 62 years, is unreasonable. However, there is no evidence to indicate that the pool characteristics would justify the use of a K factor significantly higher than that used in the majority of the Keg River Pools in the Rainbow area.

The examiners recommend that, consistent with the method of determining MRLs for the majority of Rainbow Pools, a K factor of 7,000 be adopted to determine the pool's MRL in conjunction with the currently established reserves. This will result in an MRL of 2,400 Bopd. The examiners believe that the recoverable reserves of the pool and its MRL should be further reviewed when the new well has been completed and its productivity evaluated.

6 TEHZE KEG RIVER A POOL

6.1 Background

The Tehze Keg River A Pool was discovered in October 1966 with the drilling of the well Banff Mobil Tehze 2-27-108-9. The well was drilled on the crest of a pinnacle reef that developed to a maximum thickness of 803 feet. In September 1967, a second well, Banff Mobil Tehze 15-22-108-9 was drilled in the pool.

The pool appears to be extremely stratified. There is also a 200 to 300 foot thick section in the oil zone in which the porosity has been partially infilled by bitumen. This bitumen zone occurs at both wells and probably extends across the entire reservoir. At the 2-27-108-9 well, the bitumen zone extends down to the original oil-water interface, but in neither well does it extend closer than 250 feet from the top of the reef.

Banff Oil applied to the Board in 1968 for approval of an Integrated Scheme to solvent flood the Tehze Keg River A Pool and a number of other Rainbow Keg River Pools. Approval to solvent flood the Tehze Keg River A Pool was denied by the Board because it believed that the effects of the low permeability stratified and bitumen zones could result in a significant loss of oil. The Board in its final report indicated that evaluation of the number and severity of the vertical barriers to flow in the Tehze Keg River A Pool was required before it was committed to any pressure maintenance mechanism.

After further evaluation of the pool, Aquitaine made application in August 1971 for enhanced recovery by water injection into the aquifer of the pool. The application was subsequently granted and Approval No. 1590 was issued. Aquitaine commenced water injection into the aquifer through the 2-27-108-9 well in December 1971. Production was initially taken from the 15-22-108-9 well through perforations located above the bitumen zone. In August and September 1972 two additional intervals were perforated in the producing well, one within the bitumen zone and the other across the base of the bitumen zone.

Water injection commenced in December, 1971, however, pressure surveys soon indicated that pressures above the bitumen zone were not being maintained by the injection of water at rates that balanced production. Aquitaine has been evaluating the problem and has tested transmissibility of the reservoir at various rates of production and injection. One result has been generally low rates of production since inception of the scheme. The low rates of production caused the Board to reduce the MRL for the pool to 540 Bopd effective November 1, 1973. Aquitaine has never applied to the Board for recognition of enhanced recovery for the pool.

6.2 Maximum Rate Limitation

6.21 Views of Aquitaine

Aquitaine proposed that an MRL of 2,050 Bopd be established for the A Pool using a K factor of 11,000 and the current recognized reserves of 6,400 thousand stb. Aquitaine believes that production history indicates the pool is able to produce at a much higher MRL than the 540 Bopd now in effect.

In answer to questions regarding transmissibility across the bitumen zone, Aquitaine indicated the zone is a definite inhibitor with respect to pressure communication. Aquitaine contended that with production from the upper oil zone and injection into the aquifer at pressures less than the fracturing pressure, pressures can be maintained in the upper zone at a production rate of about 500 Bopd, although this rate is not considered to be a limitation of the well to produce.

Aquitaine submitted that the restriction of the pool's MRL to 540 Bopd, based on the low production rates that resulted from the pool evaluation studies, was not indicative of the pool's true productivity. Aquitaine estimated that the oil productive capability of the pool is in the range of 1,500 to 2,000 Bopd. Aquitaine claimed that the 500 Bopd at which the pool has been producing should not be regarded as an appropriate maximum rate. However, it believes that higher rates of production would require some well recompletion above the bitumen zone. Aquitaine suggested that possibly the pool should be treated as two separate reservoirs with both injection and production taking place above and below the bitumen zone. As an alternative, injection into the lower zone at pressures in excess of 3,000 psi, which is close to the original pressure of the pool, may accomplish voidage replacement without damage. However, in Aquitaine's view, there is some doubt whether or not there will be recovery from below the bitumen zone at all, and whether oil could be expected to move through the bitumen zone.

In answer to questions regarding the validity of the currently set reserves, Aquitaine indicated that although the oil in place could be lower, the recovery of oil under water flood is going to be better than previously recognized.

Aquitaine indicated that using a K factor of 7,000 would give an MRL of much less than the pool productivity and suggested a K factor of 11,000 would be more appropriate considering the pool's productivity.

6.22 Views of Examiners

The examiners are concerned about the pressure transmissiblity across the bitumen zone at higher rates of production. They note that Aquitaine has suggested two methods of exploitation of the pool, but is uncertain which would provide the most efficient voidage replacement. These methods are dual injection and production in both the upper and lower portions of the reservoir, or pressurizing the lower zone in excess of the original pressure so that sufficient pressure response across the bitumen zone is provided. The examiners agree that either of these production methods may provide the means for necessary withdrawal replacement at higher production rates. However, the examiners are of the opinion that the requested MRL is not compatible with the production mechanism currently approved for the pool, and that use of the currently established reserves may not be appropriate for determining the pool's MRL, having regard for questionable recovery from below the bitumen zone. The examiners believe that the MRL for this pool should be established in such a manner that it is compatible with the method of depletion, reserves and points of production and injection.

In the examiners opinion, Aquitaine has not demonstrated that higher voidage rates can be effectively replaced under the existing water flood scheme, and it is noted that enhanced recovery (water flood) reserves have never been recognized for the pool. The examiners recommend that Aquitaine undertake a reservoir study which would indicate whether or not an alteration to the current method of depleting the pool is necessary and whether the presently established reserves are reasonable. In the interim, the subsisting primary depletion reserves of 6,400 thousand stb and a K factor of 7,000 are recommended for determining the pool's MRL. The result is a pool MRL of 1,300 Bopd.

7 SUMMARY OF RECOMMENDATIONS OF EXAMINERS

The examiners recommend that the reserves and reserve factors set out in Table 7.1 and the maximum rate limitations listed in Table 7.3 be adopted. For convenience, a comparison of previous, requested, and recommended values is presented in Table 7.2.

8 DECISION

The Board agrees with the recommendations of the examiners and has adopted the reserves and reserve factors listed in Table 7.1 and the maximum rate limitations listed in Table 7.3

ENERGY RESOURCES CONSERVATION BOARD

D R Craig

D.R. Craig
Vice Chairman

DATED at Calgary, Alberta
April 14, 1975

TABLE 7.1

EXAMINERS RECOMMENDED RESERVE FACTORS - POOLS CONSIDERED AT JANUARY 27, 1975 RESERVES HEARING

FORMATION Pool	(1) AREA (Acres)	(2) PAY THICKNESS (Feet)	(3) POROSITY (Fraction)	(4) 1-WATER SATURATION (Fraction)	(5) OIL SHRINKAGE (stb/bbl)	(6) INITIAL OIL IN PLACE 10^3 stb	(7) POOL RECOVERY PRIMARY (Fraction)	(7) POOL RECOVERY ENHANCED (Fraction)	(8) RECOVERABLE OIL PRIMARY 10^3 stb	(8) RECOVERABLE OIL ENHANCED 10^3 stb	(8) RECOVERABLE OIL TOTAL 10^3 stb
LOWER MANNVILLE											
Turin Lower Mannville B	500	(2.4)	0.18	0.68	0.85	969	0.10		97		97
Turin Lower Mannville C	683	(2.6)	0.18	0.68	0.85	1,430	0.10		143		143
KEG RIVER											
Rainbow Keg River B	3,530	(190.0)	0.07	0.87	0.82	260,000	0.45	0.17	117,000	44,200	161,000
Rainbow South Keg River G*	209	(237.8)	0.088	0.89	0.66	20,000	0.48	0.09	9,600	1,800	11,400
Tehze Keg River A*	175	(244.6)	0.08	0.90	0.67	16,000	0.40		6,400		6,400

* Applicant's submission was for consideration of MRL only; previously established reserves remain in effect.

TABLE 7.2

COMPARISON OF OIL IN PLACE AND RECOVERABLE RESERVES

(Thousands of Stock Tank Barrels)

Pool	Previous		Requested		Recommended	
	N	RiN	N	RiN	N	RiN
Turin Lower Mannville B	430	43	5,778	578	969	97
Turin Lower Mannville C	490	49	4,815	482	1,430	143
Rainbow Keg River B	260,000	148,000	260,000	184,000	260,000	161,000

TABLE 7.3

COMPARISON OF MAXIMUM RATE LIMITATIONS

POOL	PREVIOUS[1] K FACTOR (x 10^3)	PREVIOUS[1] MRL (Bopd)	REQUESTED K FACTOR (x 10^3)	REQUESTED MRL (Bopd)	RECOMMENDED[2] K FACTOR (x 10^3)	RECOMMENDED[2] MRL (Bopd)
Turin Lower Mannville B	7	18	7	135	7	23
Turin Lower Mannville C	7	18	7	112	7	33
Rainbow South Keg River G		480	11	3730	7	2400
Tehze Keg River A		540	11	2050	7	1300

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[1] Based on production to December 31, 1973

[2] Based on production to December 31, 1974

ENERGY RESOURCES CONSERVATION BOARD

Decision 75-6
Application No. 8337
(City of Medicine Hat)

ADDITIONAL GENERATING CAPACITY AT THE CITY OF MEDICINE HAT

1 INTRODUCTION

The City of Medicine Hat applied under sections 7.2 and 14 of The Hydro and Electric Energy Act for approval to install and operate a 15-MW[1] gas turbine and to connect the unit to its electric system. On February 6, 1975, the Board met with representatives of the City of Medicine Hat and the following parties with an interest in the subject application:

	Represented by
City of Medicine Hat (the City)[2]	W. Scott, P.Eng. T. Sissons, P.Eng. J. Parker
Calgary Power Ltd. (Calgary Power)[2]	E. J. Barry, P.Eng. E. W. Smith, P.Eng.
Alberta Power Limited (Alberta Power)[2]	K. Provost, P.Eng.
Edmonton Power (Edmonton Power)[2]	R. McClary, P.Eng.
Electric Utility Planning Council Steering Committee (EUPC)[2]	K. Jensen, P.Eng.
Energy Resources Conservation Board (The Board)[2]	G. W. Govier, P.Eng. G. J. DeSorcy, P.Eng.
(Board staff)[2]	C. J. Goodman, P.Eng. F. J. Mink, P.Eng. K. I. Montgomery, P.Eng. T. B. Gibbon

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[1] Megawatt (MW) = 1,000,000 watts

[2] Abbreviations used throughout the report

Each of the parties represented at the meeting expressed its views with respect to the application and the City submitted rebuttal information to the Board on February 11, 1975, in response to the concerns raised by the other interested parties.

The Board has considered the application largely on its merits as it relates to the City of Medicine Hat but also having regard for its possible impact on the Alberta interconnected electric system. The Board recognizes that the application has certain implications pertaining to the whole subject of the supply of electric energy in the southeastern portion of the Province which are important, but are beyond the scope of the present application before the Board. The Board has called a public hearing, proceeding No. 8379, to be held in Calgary on June 3, 1975, to consider the broad issues of electric energy supply in the southeastern portion of Alberta. The consideration of the City's application and the views expressed herein are without prejudice to any matters which may be raised at this later hearing.

At the present time the City operates its own power plant with a total net installed capacity of approximately 55 MW. This capacity is provided by gas-fired steam turbine-driven generators consisting of two small units of about 3 and 6 MW and two larger units of 15 MW and about 30 MW (31 MW net). In 1974 the City generated 279 GWh[3] of electric energy and consumed 230 GWh, or about 1.7 per cent of the total provincial consumption, and experienced a peak load of some 43 MW. The City's power plant is connected to the provincial interconnected electric system via two 138-kV[4] transmission lines as shown in Figure 1. In addition, certain 69-kV and 25-kV circuits to the north and east of Medicine Hat are fed via the City's switching facilities.

2 THE APPLICATION

The City made application for a 15-MW gas turbine unit which would be used primarily for standby and peak load purposes but may also be required to provide some base load energy from time to time. The proposed unit would be a packaged unit located in an industrial area in the northwestern section of the City and would be operated by remote control from the existing power plant. The unit would normally burn natural gas but diesel fuel could also be used if required. The proposed gas turbine would have an energy conversion efficiency of about 11,400 Btu per kilowatt-hour (at 15 degrees Celsius and at Medicine Hat's elevation) whereas the 15-MW steam-driven unit commissioned in 1974 has a conversion efficiency of about 13,200 Btu per kilowatt-hour.

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[3] 1 gigawatt-hour (GWh) = 1,000,000 kilowatt hours (KWh)

[4] 1 kilovolt (kV) = 1,000 volts

The City presented the following arguments in support of its application:

1. The City requires standby reserve capacity[5] for its power plant and the installation of the proposed unit would provide part of this needed capacity.

2. The proposed unit would provide part of the City's standby reserve capacity requirements more economically than they can presently be provided from the interconnected system. Also, the proposed unit would provide a portion of the City's future standby requirements at a fixed capital cost.

3. The City requires additional capacity to serve its forecast peak load requirements over the next few years.

4. The proposed unit would have a better energy conversion efficiency than any of the City's existing units and could be operated in place of these units for a portion of their peaking duty and thereby realize some savings in natural gas usage.

5. The proposed standby capacity could be used to supply other electrical loads in the Medicine Hat area in the event of any outages of the transmission lines connecting Medicine Hat to the provincial interconnected electric system.

6. Installation of the proposed packaged unit, separate from the existing power plant, would provide for some essential services in the event of an outage of the main switchyard at the present power plant.

3 OTHER RELATED MATERIAL

At the meeting of February 6, 1975, each of the interested parties presented its views on the application and two parties made written submissions.

3.1 Calgary Power

Calgary Power presented a submission that opposed the application on the grounds that the installation of the proposed unit may not prove suitable in terms of long range electric energy supply planning for the southeastern part of the Province. Calgary Power maintained that there already was adequate capacity reserve[6] within the interconnected electric system and presented a proposal whereby Calgary Power would provide the City with the required additional firm and standby reserve capacity until suitable long-range plans can be made for supplying the Medicine Hat and area electric requirements.

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[5] Standby reserve capacity in this case is defined as the net installed capacity less the net capacity of the largest unit less the peak load requirement. A result less than zero indicates a standby reserve deficiency.

3.2 Alberta Power

Alberta Power opposed the City's application because it also considered that there was at present sufficient capacity reserve within the interconnected system and that the installation of the proposed unit would add unneeded reserve to the system.

3.3 Edmonton Power

Edmonton Power stated that the City of Medicine Hat should be considered as a utility the same as the other utilities of the Province. The City should be expected to provide for its reserve requirements, as would one of the other major utilities, by installing capacity reserve or by purchasing it from one of the other utilities. Edmonton Power did not oppose the City's application.

3.4 EUPC

The EUPC Steering Committee, in a written submission, stated that it was not opposed to the City's application to install a 15-MW unit, however, the Steering Committee concluded that there is no need for additional capacity or energy reserve for the interconnected electric system in 1975 or 1976.

3.5 Response by the City of Medicine Hat

In response to the views expressed by the other participants in the February 6, 1975 meeting the City submitted additional arguments in support of its application as follows:

1. If the proposed unit is not installed the existing transmission facilities connecting the City of Medicine Hat to the provincial interconnected electric system would not be capable of supplying the City's combined requirement for firm and standby reserve capacity in 1976 and 1977.

2. The proposed installation of the 15-MW unit would offer significant short-term and long-term economic benefits over the proposal presented by Calgary Power at the February 6, 1975 meeting.

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[6] Capacity reserve is generally the margin of net installed capacity in a system above the peak load on the system. Typically the capacity reserve of an electric system may be about 15 to 20 per cent of the peak load on the system.

3. The installation of the proposed unit would have a minimal affect on the future long-range plans for the development of the provincial interconnected electric system.

4 ISSUES

In assessing the application the Board has confined its consideration to the following two issues:

1. The capability of the City of Medicine Hat to provide for its 1975-1977 electric energy requirements.

2. Alternatives available to meet the City of Medicine Hat's 1975-1977 electric energy requirements.

5 THE CAPABILITY OF THE CITY OF MEDICINE HAT TO PROVIDE FOR ITS 1975-1977 ELECTRIC ENERGY REQUIREMENTS

It is evident to the Board, from the application and from the information presented by the interested parties, that the important question is the means by which the City's peak load requirements, as opposed to its energy requirements, could be met in the next few years. The Board reviewed the City's projection of its month-by-month peak load requirements from 1975 to 1977, as shown in Figure 2, and developed what it considers to be the probable peak load requirements during this period. In developing its forecast the Board estimated that certain potential petrochemical plants might begin operation somewhat later than projected by the City and as a result the Board's forecast of total peak load is somewhat lower than that of the City. In view of the impact of the petrochemical requirements on the City's total peak load, the Board estimated the peak load of this industrial sector independently of the remainder of the City's load and then combined the two projections to obtain the total projection as shown in Figure 2.

At the present time the City has adequate installed generating capacity to meet its daily peak load under normal operating conditions. The City does not, however, have adequate firm capacity[7] to meet its peak load at all times. For example if, during the winter of 1975-76, the City's largest unit should experience an outage, the remaining installed capacity would not be capable of supplying the peak load. In effect at certain times during the year, the City is inherently dependent upon standby reserve capacity being available from the interconnected system in order to meet its peak load.

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[7] Firm capacity in this case is the installed generating capacity minus the capacity of the largest unit.

Based on the Board's projection of peak load it is apparent from Figure 2 that in the fall of 1976 the City's existing generating capacity would not be sufficient to supply the City's peak load even with all of its generating units operating. This condition would also exist throughout the winter of 1976-1977. This situation could develop prior to the fall of 1976 if the actual peak load should be higher than the Board's projected peak loads, and as early as the fall of 1975 if the City's projected loads as shown in Figure 2 were realized. In addition the City would continue to rely on the interconnected system for standby capacity reserve during the 1976-77 period to ensure that its peak load could be supplied.

The Board's examination of the present and projected situation in Medicine Hat indicates that, in order for the City to be able to reliably meet its peak load at all times over the next two to three years, the City will need

a) adequate standby reserve equal to the difference between its existing firm capacity, and its daily peak load, and

b) additional firm capacity continuously available after the fall of 1976.

The alternative means of meeting these requirements are discussed in the following section.

6 ALTERNATIVES AVAILABLE TO MEET THE CITY OF MEDICINE HAT'S 1975-1977 ELECTRIC ENERGY REQUIREMENTS

In the Board's view the potential alternative means of satisfying the requirements of Medicine Hat, as identified in the conclusion to section 5 above, are:

1. Construction of additional transmission lines from the interconnected system to Medicine Hat.

2. The use of the existing transmission lines following any planned upgrading of these lines.

3. Installation of additional generating capacity, such as the proposed 15-MW gas turbine at Medicine Hat.

The Board believes that the first alternative would not be practical since there is not sufficient time in which to construct a transmission line from a suitable point on the interconnected system to provide the necessary capacity to Medicine Hat. Also, such a line would be very costly in terms of meeting only the short-term requirements. In addition none of the interested parties indicated that there were any plans for the construction of such transmission capacity in the near future.

With respect to the second alternative, Calgary Power stated that the existing 138-kV transmission line from Calgary to Medicine Hat would be upgraded by adding capacitor banks at Brooks, Taber and possibly Medicine Hat to maintain adequate voltage at various loads served by Calgary Power along these lines. This work would be carried out within the next year or so irrespective of the situation at Medicine Hat. In order for the upgraded existing transmission facilities to meet the requirements of the City they would have to be capable of meeting the combined standby reserve and firm capacity requirements of Medicine Hat for the next two years as defined by items (a) and (b) in section 5. The Board's analysis indicates that the upgraded transmission facilities appear capable of supplying Medicine Hat's requirements for standby reserve capacity and firm capacity until sometime in 1976. After the fall of 1976, however, assuming no further generating capacity is installed at Medicine Hat, these transmission facilities would be required to provide firm capacity on a continuing basis in addition to providing standby reserve capacity for Medicine Hat's 30-MW unit. The Board calculations indicate that after the fall of 1976 the transmission facilities do not appear capable, in the event of an outage of the 30-MW unit, of supplying the City's combined firm capacity and standby reserve capacity requirements at an acceptable voltage level.[8] Similarly, in the event of an outage of either a 240-kV or 138-kV line in the southern part of the Province during periods of peak load, it would not be possible to maintain an acceptable quality of service at Medicine Hat. The Board recognizes that if there were no transmission or generating unit outages at time of peak load, and no transmission outages when any of Medicine Hat's generators were out of service, Medicine Hat's load could be served satisfactorily. However, the Board does not believe that proceeding on this basis would be acceptable since there is always some possibility of an outage of transmission or generating equipment, or an unexpected increase in load and this possibility represents a risk to Medicine Hat of not being able to adequately serve all of its customers. In addition, adverse weather conditions could cause a prolonged outage of both the 138-kV transmission lines interconnecting Medicine Hat and a situation in which the City could be forced to resort to load curtailment.

The proposed addition of a 15-MW gas turbine unit would increase Medicine Hat's net installed generating capacity to some 70 MW as shown in Figure 2 and, in the Board's view, allow the City to meet its peak load over the 1976-77 winter period with an acceptable degree of reliability. If there were an outage of the 30-MW unit the remaining 39 MW of generating capacity at Medicine Hat and the upgraded transmission facilities together would be capable of supplying the remaining required capacity to meet the City's peak load. If, on the other hand, there should be an outage of a portion of the transmission facilities serving Medicine Hat, the City would still have adequate installed generating capacity to meet its peak load over the winter of 1976-77. The Board concludes that the installation of additional generating capacity at Medicine Hat, such as a 15-MW gas turbine, is the only alternative which would satisfy the necessary conditions noted at the conclusion of section 5. Furthermore the Board does not believe that there is any reason which would justify subjecting the City to the risk of an interruption or a reduction in the quality of electric service. The Board does recognize, however, that the installation of the proposed unit is a short-term solution to the problem and even with this additional capacity the City would not have adequate capacity to meet its 1977-78 peak load requirements.

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[8] A reduction in the voltage level at Medicine Hat would cause a reduction in the quality of electric service to the City's residents.

The Board does not consider the City's proposal to use gas for the 15-MW gas turbine to be inconsistent with the Board's and the Government's position regarding the use of gas for the generation of electric energy. These positions provide for the use of natural gas in small units and for the purposes of peaking or standby service.

In its examination of the application the Board has not specifically examined the cost of electric energy generated by the proposed unit. The Board notes, however, that the proposed unit would have some short-term, and long-term economic benefits to the City of Medicine Hat. Since the proposed unit would be a packaged power plant it could be relocated in the future if necessary and should have a good salvage value. Therefore the Board does not believe that the installation of the proposed unit would have any significant impact on the future development of the provincial interconnected electric system.

7 MINISTERIAL APPROVAL

The Hydro and Electric Energy Act, section 7.2, subsection (3), provides that

> (3) Prior to the Board approving the construction and operation of the power plant, it shall refer the application to the Minister of the Environment for his approval of the application as it affects matters of the environment.

The Board in compliance with the above section has referred the application to the Minister of the Environment for his approval of the application as it affects matters of the environment. Any approval given by the Minister will be incorporated into any approval given by the Board, and any Board approval will be subject to any conditions imposed by the Minister with respect to matters of the environment.

8 DECISION

(Superseded - See footnote)

Having regard for its responsibilities under The Hydro and Electric Energy Act the Board is prepared, subject to the approval of the Minister of the Environment with respect to environmental matters, to issue an approval to the City of Medicine Hat for the installation and operation of a 15-MW gas turbine.[9] The Board is also prepared to issue an order under section 14 of The Hydro and Electric Energy Act directing the connection of the new unit to Medicine Hat's electric system.

ENERGY RESOURCES CONSERVATION BOARD

February 26, 1975.

G. J. DeSorcy
Board Member

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[9] This decision has been superseded as a result of an application for amendment by the City of Medicine Hat which is discussed in a supplement to this report.

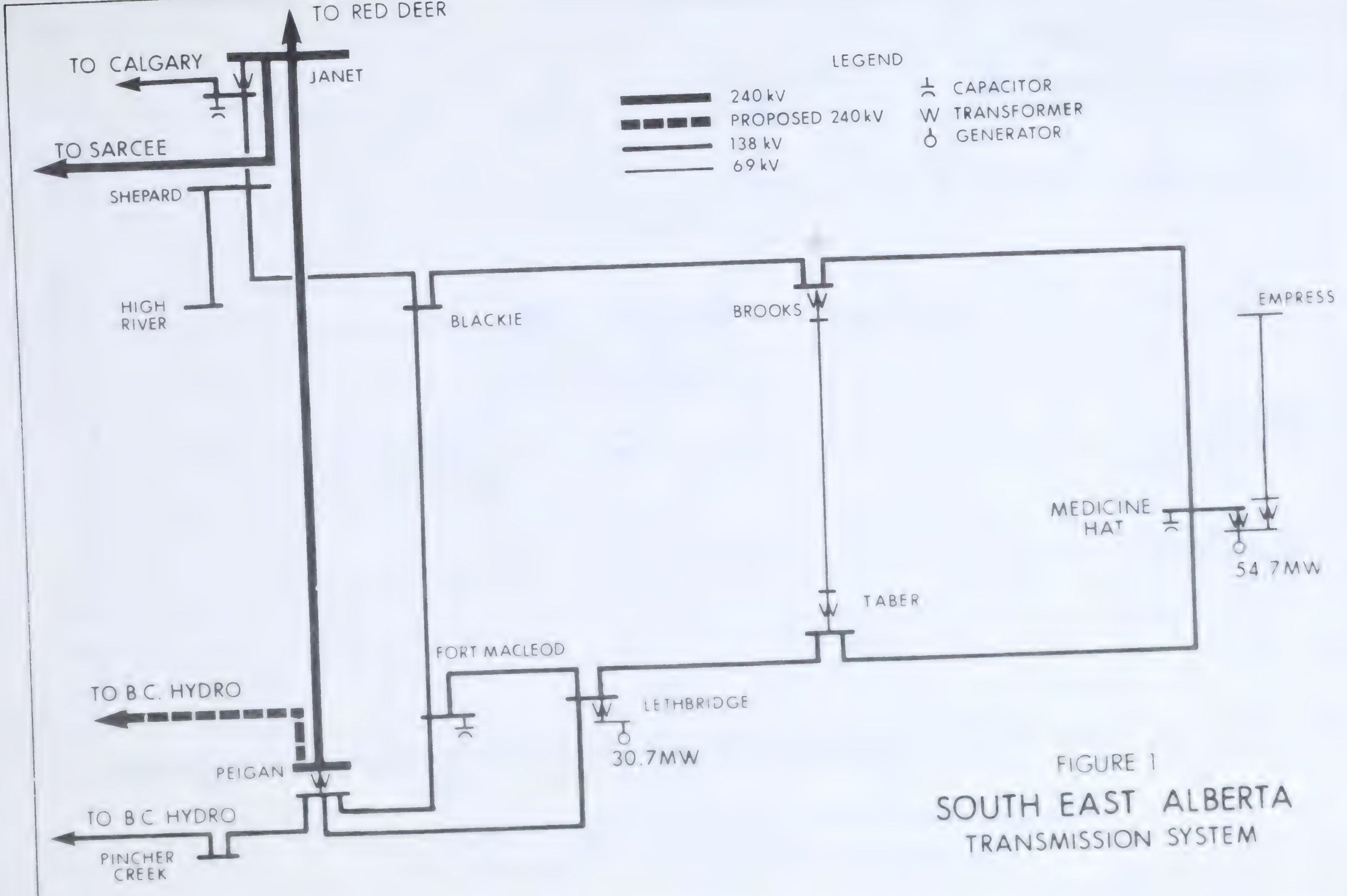

FIGURE 1

SOUTH EAST ALBERTA
TRANSMISSION SYSTEM

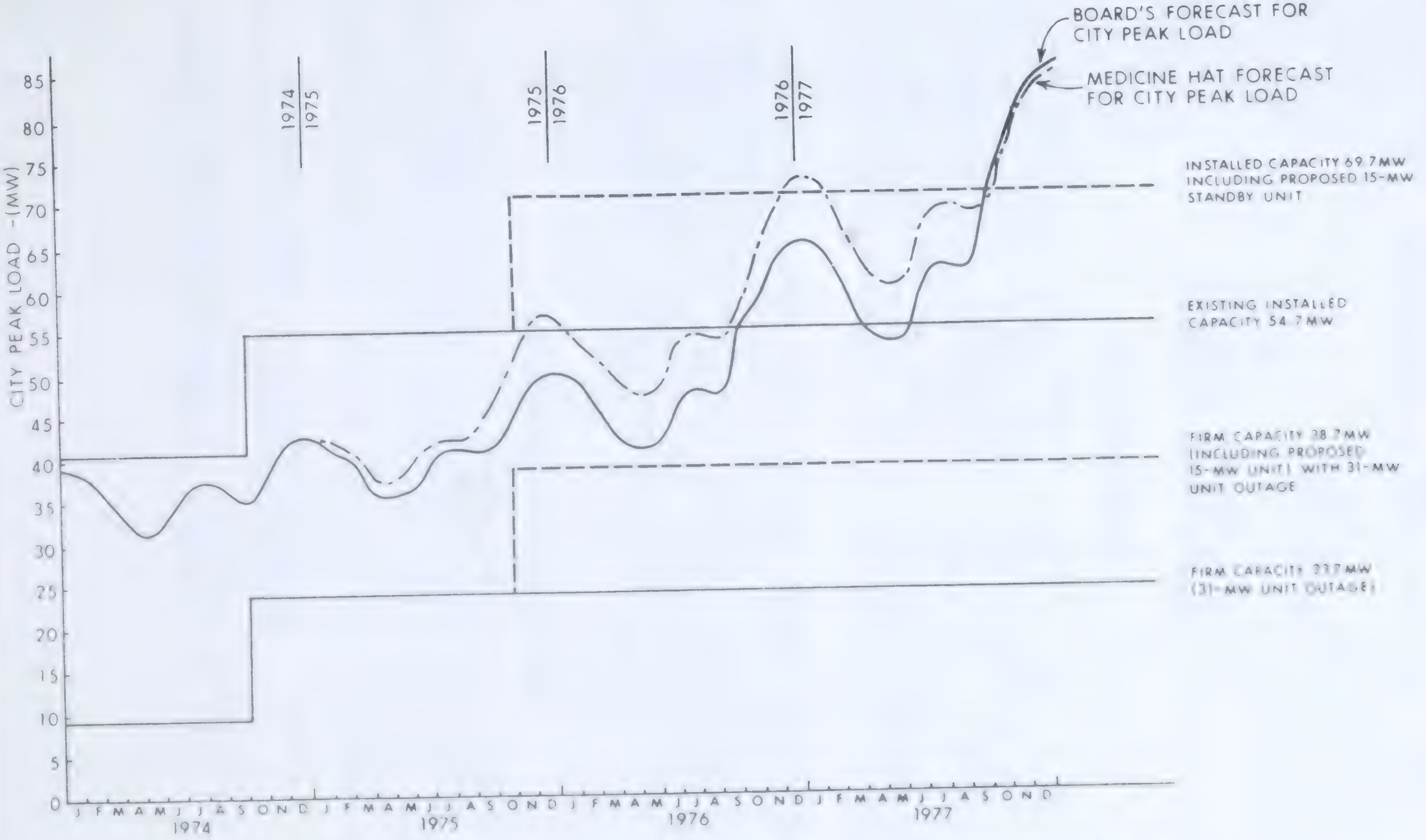

FIGURE 2 MEDICINE HAT PEAK LOAD AND RESERVE CAPACITY AS FORECAST BY THE CITY AND BY THE ERCB

ENERGY RESOURCES CONSERVATION BOARD

Supplement to Decision 75-6
Application No. 8337

ADDITIONAL GENERATING CAPACITY AT THE CITY OF MEDICINE HAT

1 INTRODUCTION

On February 26, 1975, the Board informed the City of Medicine Hat orally of its decision on Application No. 8337 in which it approved, subject to the approval of the Minister of the Environment with respect to environmental matters, an application by the City of Medicine Hat to install and operate a 15-MW peaking and standby unit. Subsequent to the Board rendering its decision, but prior to the issuance of the Decision Report or necessary approvals, the City submitted an application to the Board requesting an amendment of the decision and any corresponding approvals.

Copies of the City's application for amendment were forwarded to the interested parties involved in the City's initial application. Each of these parties was given the opportunity to comment on the City's further application but none of the parties indicated a desire to make a further submission. The Board considered that a further meeting with the applicant and interested parties was not necessary and proceeded to consider the City's application for amendment of the Board's decision.

2 THE APPLICATION FOR AMENDMENT

The City's application for amendment was for the approval of an alternate unit to that authorized on February 26, 1975 by the Board. The new unit proposed in the application for amendment would be of 21 MW capacity and would have an energy conversion efficiency of 13,400 Btu per kilowatt-hour. The unit initially proposed and approved by the Board would have had respective specifications of 15 MW and 11,400 Btu per kilowatt-hour.

The City presented the following arguments in support of its application for amendment of the Board's decision:

1. The new unit would have lower total installed cost and a lower per kilowatt cost than the originally proposed 15-MW unit.

2. The increase in capacity from 15 to 21 MW would provide additional economic benefits to the City over purchasing an equivalent amount of standby reserve capacity from the interconnected system.

3. The new unit, although of lower efficiency than the 15 MW unit approved would have an energy conversion efficiency equal to or better than any of the existing Medicine Hat generating units.

3 VIEWS OF THE BOARD

The Board believes that the factors considered and the conclusions reached by the Board in section 6 of its Decision 75-6 apply equally to the larger capacity unit now proposed by the City. With the lower total cost than the unit originally proposed additional economic benefits, over and above those projected for the originally proposed unit, should be realized by the City since it would be able to supply a larger proportion of its standby capacity requirements at a reduced total cost. Since the new unit would also be a packaged unit the Board is satisfied that it also would have a good salvage value and its relatively small capacity would not have any significant impact on the future development of the Alberta interconnected electric system.

The Board recognizes that, although the unit now proposed has a better energy conversion efficiency than some of the City's existing units, it would have a lower efficiency than the 15-MW unit initially proposed. Although the lower efficiency of the larger unit would result in additional gas being consumed per unit of output, the Board notes that the proposed unit would be used to provide base load energy only during the initial two years after its installation, and following this period it would be used for standby and peaking purposes. The Board is satisfied that the cost of the additional gas used by this larger unit would be more than offset by the increased economic benefits which Medicine Hat should be able to obtain by installing the 21-MW unit.

As the capacity of the proposed unit exceeds 15 MW any approval given by the Board would require the authorization of the Lieutenant Governor in Council pursuant to section 7.2, subsection (2) of The Hydro and Electric Energy Act.

4 DECISION

Having regard for its responsibilities under The Hydro and Electric Energy Act the Board is prepared, subject to the approval of the Minister of the Environment with respect to matters affecting the environment and, subject to the approval of the Lieutenant Governor in Council pursuant to section 7.2 of the said Act, to issue an approval to the City of Medicine

Hat for the installation and operation of a 21-MW gas turbine power plant. The Board is also prepared to issue an order under section 14 of The Hydro and Electric Energy Act directing the connection of the new unit to Medicine Hat's electric system.

The form of the above mentioned approval and order would be as set out in Appendix B and subject to the terms and conditions therein contained.

ENERGY RESOURCES CONSERVATION BOARD

April 21, 1975.

G. J. DeSorcy, P.Eng.
Board Member

APPENDIX A

Subsisting Approvals

The following licences and approvals relating to Medicine Hat's existing generating facilities have been issued:

1. June 24, 1904 - Licence No. 3 from the Department of the Interior of the Government of Canada to divert 1,870 cubic feet of water per second from the South Saskatchewan River to be used through the waterworks for "Other purposes".

2. June 5, 1915 - Licence No. 27 from the Department of the Interior to divert 5.57 cubic feet of water from the South Saskatchewan River for other purposes, to be used through the waterworks.

3. March 8, 1973 - Licence to Operate No. 73-AL-016 under The Clean Air Act.

4. May 11, 1973 and October 24, 1974 - Licence to Operate No. 73-WL-042 and 73-WL-042A under The Clean Water Act.

5. May 24, 1973 - Approval No. HE 7306 approving the construction and operation of a power plant located in the Northwest quarter of Section 35, Township 12, Range 6, West of the 4th Meridian.

6. May 24, 1973 - Order No. Misc. HE 7303 ordering the connection of the existing power plant to Medicine Hat's distribution system.

APPENDIX B

FORMS OF APPROVAL AND ORDER

Form of Approval

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of a power plant
of the City of Medicine Hat

APPROVAL NO. HE 7507

WHEREAS the Energy Resources Conservation Board is prepared to grant an application by the City of Medicine Hat for approval to construct and operate a 21 MW gas turbine power plant, subject to the conditions herein contained, and the Minister of the Environment has given his approval, hereto attached, insofar as the application affects matters of the environment.

THEREFORE, the Energy Resources Conservation Board, pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, and the Lieutenant Governor in Council having given his authorization by Order in Council dated , 1975 and numbered O.C. /75, hereby orders as follows:

1. The construction and operation by the City of Medicine Hat, (hereinafter called "the Operator") of a power plant, as such power plant is described in an application to the Board from the Operator, filed January 27, 1975 and as amended by a subsequent application to the Board from the Operator, filed March 11, 1975, is approved, subject to the following terms and conditions.

2. The power plant shall be located in the southwest quarter of Section 14, Township 13, Range 6, West of the 4th Meridian.

3. This approval, insofar as it pertains to matters of the environment, is subject to the approval of the Minister of the Environment, attached hereto as Appendix A, and to the terms and conditions therein contained.

4. The City shall provide such further information to the Board with respect to the operation of the power plant as the Board may from time to time specify.

5. The Board at any time,

   (a) upon its own motion or the request of the Department of the Environment, or

   (b) upon the application of an interested person,

may vary the terms and conditions hereof or rescind this approval.

MADE at the City of Calgary, in the Province of Alberta, this day of , 1975.

ENERGY RESOURCES CONSERVATION BOARD

G. J. DeSorcy
Board Member

APPENDIX A TO APPROVAL NO. HE 7507

Department of the Environment

MINISTERIAL APPROVAL

No. ERCB

Edmonton, Alberta

Pursuant to section 7.2 of The Hydro and Electric Energy Act, I , Minister of the Environment, hereby approve an application filed January 27, 1975, and as amended by an application filed March 11, 1975, by the City of Medicine Hat with the Energy Resources Conservation Board, in the matter of a 21 megawatt gas turbine unit, insofar as it affects matters of the environment.

MINISTER OF THE ENVIRONMENT

FORM OF ORDER

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

ORDER NO. MISC. HE 7504

An order regarding a power plant of the City of Medicine Hat

The Energy Resources Conservation Board, pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, hereby orders as follows:

1. The City of Medicine Hat, at the time of commencement of operation of a 21 megawatt gas turbine, shall connect this unit to its distribution lines at a point in Section 14, Township 13, Range 6, West of the 4th Meridian.

MADE at the City of Calgary, in the Province of Alberta, this day of , 1975.

ENERGY RESOURCES CONSERVATION BOARD

G. J. DeSorcy
Board Member

ENERGY RESOURCES CONSERVATION BOARD

Decision 75-7
Applications No. 7869,
7823, 7913

STONY PLAIN - DEVON PROJECT

1 INTRODUCTION

1.1 The Applications and Hearing

Calgary Power Ltd. submitted three applications, Nos. 7869, 7823, and 7913, under sections 9, 11, 13 and 17 of The Hydro and Electric Energy Act, to upgrade existing transmission and substation facilities in the area between Stony Plain and Devon, west of Edmonton.

A public hearing was held by the Energy Resources Conservation Board on October 22, 1974 to consider these applications with V.Millard, J.I.Strong, P.Eng., and G.J.DeSorcy, P.Eng. sitting.

1.2 Appearances

The following table lists those parties that appeared at the hearing:

Table of Participants

NOTE: Abbreviations shown in parentheses are used in this report.

Name	Represented by	Witnesses
Calgary Power Ltd. (Calgary Power)	H.M.Kay	E.J.MacLeod, P.Eng. R.F.Bell, P.Eng. B.Vic W.Berg, P.Eng.
Roland R. Goertz	R.R.Goertz	
Halton-Grove Realty	D.J.Stratton	
D.S.K. Gray	T.W.Gallant	

Estate of Elizabeth Bauer (the Bauers) ....

W.J.Bauer

Hilton Baron ....

E.J.Walters

William Weitzel ....

E.J.Walters

Edmonton Regional
Planning Council (ERPC) ....

J.E.Hilliard

Sigma Lands ....

H.Bellingham

Owners-Section
14-51-26-W4 ....

J.N.Agrios

Ann Kapty ....

A.Kapty

Mr. & Mrs. M. Berretti ....

M.Berretti

County of Parkland No. 31 ....

M.Bailey

William & Mary McLean ....

W.F.McLean
M.McLean

QCTV ....

D.S.Rowand E.Polanski

Devon Nurseries ....

W.Hutchison

Energy Resources Conservation Board staff (Board staff) ....

A.L.McLarty
C.J.Goodman, P.Eng.
W.L.McVeigh

In addition the following interveners made written submissions to the Board but did not appear at the hearing:

Name	Location
J.Colin Barron	Part of S½ 26-52-27-W4
Maury G. Van Vliet	SE¼ 27-52-27-W4
Carl Spady Paul Spady	SE¼ 12-53-28-W4
James and Constance Thompson	NW¼ 26-51-26-W4
Charles Silver	Part of SW¼ 27-51-26-W4
Allen R. Haigler	Lot 34 SW¼ 26-51-26-W4
J.Martin	NE¼ 10-51-26-W4
W.Edgar	Lot 12 SE¼ 34-51-26-W4
Donald G. Bittorf	SE¼ 15-51-26-W4
D.A.Wright	NE¼ 10-51-26-W4
Mr. and Mrs. M.M.Dixon	SE¼ 22-51-26-W4
Vladimir Borys	NW¼ 27-50-26-W4
Wayne Halabisky	Lot 13 SE¼ 34-51-26-W4
Daniel and Cecilia Kelly	NW¼ 2-52-26-W4

The majority of these interveners could be divided into two general categories: one group comprising those who commented on the difficulty of operating farm equipment around the transmission line poles; the other group comprising those concerned about such things as the clearing of trees, the aesthetic impact of the transmission lines, and possible radio and television interference.

2 BACKGROUND TO THE APPLICATION

The applicant proposed the Stony Plain - Nisku project to provide for increased loads developing on the Calgary Power system west of Edmonton, and to provide higher capacity alternative transmission to Devon, Spruce Grove, and Stony Plain. As shown on the diagram of the existing and proposed transmission lines in Figure 1, prior to this project the Stony Plain - Nisku area was supplied via the 69-kV[1] transmission lines CP 123L, CP 75L, and CP 503L. In 1973 the Board approved an application by Calgary Power to construct a 138-kV transmission line, CP 739L, from Wabamun Power Plant Substation CP 19S to Transmountain Pipeline Pumping Facility Substation CP 787S (Permit and Licence CP 73-2 and CP 72-2A). In 1974 the Board approved an application to raise the voltage of transmission line CP 503L between Nisku Substation CP 149S and Devon Substation CP 14S from 69 kV to 138 kV (Permit and Licence CP 74-20). The current applications, 7869, 7823, and 7913, if approved, would complete the upgrading of the 138-kV transmission network between Stony Plain and Nisku.

These three applications seek approval for the construction or rebuilding of approximately 27.7 miles of 138-kV transmission line, designated CP 739L, and the establishment of two new substations, Stony Plain Substation CP 434S and Acheson Substation CP 305S. The applications also seek approval for the dismantling of two existing substations and the salvaging of portions of existing 69-kV transmission lines.

Application No. 7869 relates to the section of CP 739L between Transmountain Pipeline Substation CP 787S and the proposed Stony Plain Substation CP 434S. Application No. 7823 deals with the proposed substations Stony Plain CP 434S and Acheson CP 305S, and the proposed section of CP 739L between these substations. This application also covers the salvaging of Spruce Grove Substation CP 397S, and the discontinuation of the 69-kV operation of transmission line CP 123L between CP 104L and CP 75L. Application No. 7913 pertains to the section of CP 739L between the proposed Acheson Substation CP 305S and the existing Devon Substation CP 14S. This application also proposes the salvage of Jasper Place Substation CP 272S, the discontinuation of the 69-kV operation and the partial dismantling of transmission line CP 75L from CP 233L west to the City of Edmonton boundary.

The applications were advertised for objections, and since several interventions were received and could not be resolved, the Board decided to hold a public hearing on October 22, 1974. At the hearing the Board requested additional material from Calgary Power. This material was submitted to the Board in the period between November 6, 1974 and February 11, 1975.

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[1] kV is the symbol used in this report for kilovolts (thousands of volts).

3 DEFINITION OF ISSUES

The Board considers the following to be issues relevant to the disposition of these applications:

(1) the need for upgrading the electrical transmission facilities between Stony Plain and Devon, and in particular the need for

- (a) the 138-kV transmission line proposed from Stony Plain to Devon; and
- (b) the proposed substations; and

(2) the location of the proposed transmission line and substations.

4 THE NEED FOR UPGRADING THE ELECTRICAL TRANSMISSION FACILITIES BETWEEN STONY PLAIN AND DEVON

4.1 The 138-kV Transmission Line Proposed from Stony Plain to Devon

4.11 Views of the Applicant

Calgary Power supplied information on the need for the transmission line in its applications, at the public hearing, and in further technical information provided after the hearing, as requested by the Board.

The applicant noted two guidelines that it applies when planning the supply of electrical energy to a given area. The first is that all areas with peak loads of 15 MVA[2] or more should have alternative sources of supply. The applicant therefore proposed a plan in which each substation on transmission line CP 739L between and including Transmountain Substation CP 787S and Devon Substation CP 14S, could be supplied from either the Stony Plain or the Devon end of the transmission line. The second guideline is that a transmission line should have the capacity to transmit the required peak load while maintaining a load end voltage of not less than 90 per cent of the source end voltage[3]. That is, the voltage drop on the line should be no greater than 10 per cent.

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[2] MVA is the symbol used for megavolt-amperes (millions of volt-amperes), an alternative expression for peak electric load. Load is also often expressed in megawatts (MW) where 1 megawatt is equal to 1,000,000 watts. A load in MW is equal to (MVA x power factor) where the power factor is typically in the range of from 0.8 to 0.9.

[3] Note that this guideline does not relate directly to the voltage level maintained at the customer's service, since the latter is adjusted by the substation voltage regulator. The guideline for the transmission line is intended to ensure a satisfactory primary voltage at the substation.

The applicant stated that transmission line CP 503L was rebuilt from 69 kV to 138 kV between Nisku Substation CP 149S and Devon Substation CP 14S. The original 69-kV line was projected to be overloaded by 20 per cent in 1978. The applicant said that the rebuilt 138-kV line would have a theoretical capacity of 160 MVA with a voltage drop of 10 per cent, but that the thermal limit would be 100 MVA[4]. As well, the applicant stated that it had constructed a 138-kV transmission line from Wabamun Substation CP 19S to Transmountain Substation CP 787S and thus has 138 kV available at Transmountain Substation CP 787S and Devon Substation CP 14S.

The applicant provided information concerning the present populations and electrical loads in the towns of Stony Plain and Spruce Grove, and projected the future populations[5] and loads. The applicant said that the bases of these projections were a 1974 peak load of approximately 1 kVA per person[6], and an annual increase in the consumption of electric energy per person of 4.76 per cent. The applicant stated that the figure of 1 kVA per person was indicated by load readings taken at Stony Plain and Spruce Grove, and that the 4.76% growth figure was from a 1972 Calgary Power report on future electrical energy requirements.

Using the bases mentioned above, the applicant projected that the Stony Plain population, which was 2,042 in January 1974, would grow to 6,000 by 1981 and to 12,000 by 2001. The projected peak electrical load would grow from 2 MVA in January 1974 to 42 MVA in year 2001. Similarly, for Spruce Grove the applicant predicted a population growth from 5,380 in January 1974, to 15,000 in 1981 and to 30,000 in year 2001. The corresponding increase in peak load would be from 5 MVA in January 1974 to 105 MVA in the year 2001. The applicant also provided information on the load densities in the rural portion of the Stony Plain - Devon area in 1974 and 2001. This information indicated that the rural load would grow from approximately 13 MVA in 1974 to approximately 87 MVA in 2001.

The applicant said that the 1974 peak load for the Stony Plain Indian Reserve was 100 kVA for a population of 360. The possibility of the residential, commercial, and industrial development of a portion of the Indian Reserve is under consideration. This development could result in an ultimate population of 40,000 people, and Calgary Power projected that if this population were reached in the year 2001, the peak load in that year would be 140 MVA.

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[4] The thermal limit is the maximum rate at which electric energy can be transmitted by the line without excessive heat being developed.

[5] The applicant stated that these projections were based on a study by the Edmonton Regional Planning Council.

[6] kVA is the symbol used for kilovolt-amperes. The figure, 1 kVA per person, takes into consideration domestic, commercial, and industrial loads. At 1 kVA per person a town of 5,000 people would have a peak load of 1 kVA x 5,000 = 5,000 kVA = 5 MVA.

In summary, the applicant submitted projected loads for the area between Stony Plain and Devon to be served by the proposed substations (see Figure 2), the total load would increase from some 20 MVA in 1974 to approximately 80 MVA in 1979 and to over 300 MVA in 2001. These projected loads indicate that, according to Calgary Power's guideline, the Stony Plain - Devon area requires an alternative source of supply.

According to the applicant the main 69-kV transmission lines existing between CP 787S and CP 14S, lines CP 516L, and CP 75L and CP 123L are either inadequate, or will be inadequate within a year, to provide the loads in the area with a reliable alternative supply without excessive voltage drop. The applicant said that to provide reliable alternative supply within acceptable voltage drop limits, a 138-kV line would be required between CP 787S and CP 14S. The line proposed would provide reliable alternative supply from the Devon end with a 5.3 per cent voltage drop at 1978 peak load, and from the Wabamun end with a 7.9 per cent voltage drop at 1978 peak load. The peak load on the existing Spruce Grove Substation CP 397S was 10.27 MW in January 1974 compared to 6.96 MW in January 1972. This total 2-year increase of 46 per cent represents an average yearly increase of 21 per cent.

Future plans of the applicant include establishing a 240/138-kV substation on transmission line CP 905L, which is 2.5 miles north of, and parallel to, Highway No. 16 in the Stony Plain - Devon area. Under this plan a 138-kV transmission line would connect this substation to CP 305S, and provide an additional electric energy source in the area. The applicant also expects to construct an additional substation on CP 739L south of CP 305S, if the possible development on the Stony Plain Indian Reserve proceeds.

4.12 Views of the Interveners

Although none of the interveners mentioned electric load growth specifically, several provided information regarding proposed industrial and residential development in the area.

Mr. Stratton said that his client, Halton-Grove Realty (NE 31-52-27-W4) is seeking approval for an industrial subdivision south of the CNR tracks in NE 31-52-27-W4, although this land is not presently zoned for industrial use. He also made general reference to subdivision plans on other lands of his client in the area.

Mr. Hilliard of the ERPC said that the population of Spruce Grove would likely grow to approximately 13,500 people within the existing town boundaries, and also that the development of residential subdivisions in two quarter-sections east of Spruce Grove and one quarter-section west of Spruce Grove is planned. Regarding the area between the Stony Plain Indian Reserve and the North Saskatchewan River, Mr. Hilliard said that development would be limited to country residences with a minimum lot size of 2 to 3 acres. He also mentioned that there is a proposal for a residential subdivision in Section 33-50-26-W4 west of Devon in the next 3 to 5 years.

Mr. Diemer of the ERPC said that Stony Plain would grow mainly within its existing boundaries. Any residential expansion would take place to the south of Stony Plain, and any industrial development would take place north of Highway No. 16.

Mr. Bailey of the County of Parkland No. 31 provided some information on the potential development on the Stony Plain Indian Reserve and said that the planning for the development involved the Federal Department of Public Works. The development would be industrial, commercial, and residential. His personal estimate of the time for the population to reach 40,000 was 15 years; however, he said that other estimates were as low as 5 years.

Mr. Nyberg (NE 22-51-26-W4), and Mr. Bauer (SW 12-53-28-W4) made general references to subdivision plans in their submissions, but did not make any specific comment regarding the need for the proposed transmission line.

4.13 Views of the Board

The Board believes that both of the guidelines stated by the applicant, namely providing a back-up supply for loads over 15 MVA, and designing the transmission system for voltage drops of no more than 10 per cent, are reasonable, and in this instance it accepts them as a basis for determining the transmission line capacity needed in this region.

Based on the load growth that has occurred at the existing Spruce Grove Substation CP 397S, and on the figures for population growth in similar recently developed areas, the Board expects that the load in the Stony Plain - Spruce Grove area will soon reach 15 MVA. Thus the Board agrees that, following the 15-MVA load guideline, a reliable back-up supply should be available for these two towns.

The Board believes that the applicant has presented reasonable calculations of the resulting voltage drop on various line configurations if the supply from either the Stony Plain or Devon end was lost, and that the 138-kV transmission line between CP 787S and CP 14S is necessary to meet the second guideline regarding the acceptable voltage drop of 10 per cent.

With respect to the load growth in the Stony Plain - Devon area, the Board believes that if a townsite were developed on the Stony Plain Indian Reserve, the rate of growth of other towns in the area, such as Spruce Grove, might be reduced. However, the Board still agrees with the projected overall rate of load growth in the Stony Plain - Devon area. The Board also notes that the plans for industrial and residential subdivisions that were mentioned by the interveners support the forecast increase in population and electrical load in this area.

In summary the Board believes that increased transmission capacity is needed and that the applicant's proposed 138-kV transmission line between CP 787S and CP 14S is an acceptable method of providing electrical service to the Stony Plain - Devon area.

4.2 Substations

4.21 Views of the Applicant

Calgary Power proposed the construction of two new 138/25-kV substations, Stony Plain Substation CP 434S and Acheson Substation CP 305S, in the locations indicated on Figure 3. CP 434S would serve the Stony Plain - Spruce Grove area, and CP 305S would serve the rural area east of Spruce Grove and north of Devon. The general area to be served by these two substations is shown on Figure 2.

The applicant stated that, with regard to the choice of a substation location to serve the Stony Plain - Spruce Grove area, it had considered the rebuilding of the 69/25-kV Spruce Grove Substation CP 397S. However, because the extensive modification required to convert CP 397S from 69/25-kV operation to 138/25-kV operation would be the equivalent of building a new substation, the applicant proposed to build a new substation, CP 434S, in a more central location with respect to the towns of Stony Plain and Spruce Grove. The applicant stated that the more central location would have the advantage of reducing the length of feeder lines required and would thus also reduce the electrical energy losses on these lines relative to other schemes such as A or B noted below.

At the request of the Board the applicant provided detailed costs for the following four alternative substation arrangements to serve the Stony Plain - Spruce Grove area:

A - Establish one substation on the site of CP 787S to serve both towns;

B - Establish one substation on the site of CP 397S to serve both towns;

C - Establish one substation on the proposed site of CP 434S to serve both towns (Calgary Power's preferred plan); and

D - Establish two substations, one on the site of CP 787S to serve Stony Plain and one on the site of CP 397S to serve Spruce Grove.

Table 1 is a summary of the 1974 present value of the carrying charges and losses for years 1974 to 2001 for each alternative. Four cost categories were considered as follows:

(i) construction of substation(s),

(ii) construction of 25-kV distribution lines,

(iii) losses in energy and peak power capacity, and

(iv) construction of future 138-kV transmission lines.

TABLE 1

SUMMARY OF TOTAL PRESENT VALUE OF COSTS FOR EACH ALTERNATIVE

ITEM		ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D
(i)	Substation	$1,217,933	$1,156,450	$1,150,791	$1,472,601
(ii)	Distribution	386,023	267,386	160,148	113,371
(iii)	Losses				
	-Energy	101,152	80,709	49,940	42,244
	-Capacity	124,341	99,213	61,389	51,928
(iv)	Transmission	51,327	43,790	48,815	52,524
		$1,880,776	$1,647,548	$1,471,083	$1,732,668

For each alternative the cost of substation construction forms the major portion of the total cost. Overall the least expensive alternative would be Alternative C with a total cost of $1,471,083. Relative to this figure Alternative A would cost some $410,000 more, Alternative B some $175,000 more and Alternative D some $260,000 more. The additional costs of Alternatives A and B would result mainly from the increased length of 25-kV distribution lines that would have to be built, and the losses associated with these lines. The additional cost of Alternative D results from the need to construct two separate substation sites. The applicant noted that each alternative held certain advantages with respect to limiting the adverse aesthetic impact on the area. The applicant noted that the economic study supported its choice of Alternative C.

With respect to the proposed Acheson Substation CP 305S, the applicant stated that the westward expansion of the City of Edmonton and the removal of Jasper Place Substation CP 272S required the construction of a new 138/25-kV substation to serve the load within the applicant's service area that was previously served from CP 272S. Given the proposed location of CP 434S and the load distribution in the area between CP 434S and CP 14S in Devon, the applicant chose a central location for the proposed Acheson Substation CP 305S with respect to the electrical load it would serve (see Figure 2).

The applicant stated that the initial installed transformer capacity at Stony Plain Substation CP 434S would be 25 MVA, while the initial load would be 13 MVA. The applicant estimated that by year 2001 the installed capacity would be 252 MVA, serving a load of 168 MVA. At Acheson Substation CP 305S, the applicant would install a 7.5-MVA transformer initially. The Acheson Substation CP 305S would supply the initial development proposed for the Stony Plain Indian Reserve, as well as the load in the rural area surrounding the substation. The applicant stated that if either CP 434S or CP 305S were out of servive, the other substation would feed the additional load through the interconnecting 25-kV distribution lines. A supply of roughly 10 MW is available from North Calder Substation CP 37S using line CP 36L.

The applicant has indicated that the 138-kV buses at CP 434S and CP 305S would be constructed such that if the 138-kV supply from either Devon Substation CP 14S or Transmountain Substation CP 787S was unavailable, the 25-kV distribution lines at CP 434S and CP 305S could still be supplied.

4.22 Views of the Interveners

The only intervener to question the need for the establishment of the new substations was Mr. Stratton (NE 31-52-27-W4). He suggested that the proposed CP 434S was not particularly advantageous with regard to the existing transmission line, and further he suggested that Calgary Power should consider upgrading Transmountain Pipeline Substation CP 787S to serve the increased load.

4.23 Views of the Board

The Board agrees with the applicant that, because of the increase in the populations of Spruce Grove and Stony Plain, the load on the existing 69/25-kV substation, Spruce Grove CP 397S, is near the capacity of the existing substation transformer and is increasing rapidly. The Board therefore agrees that additional substation capacity is required in the Stony Plain - Spruce Grove area.

The Board believes that the need for a new substation, designated Stony Plain Substation CP 434S, was not obvious, particularly because substations CP 397S and CP 787S exist in the same vicinity. The Board therefore considered the four possible alternative methods of supplying the towns of Stony Plain and Spruce Grove for which Calgary Power submitted cost data (see Alternatives A, B, C, and D in Section 4.21).

The Board's evaluation of the alternatives included the consideration of the aesthetic impact on the area, the reliability of supply, and the economic costs resulting from the choice of substation sites. Table 2 was derived from information provided by Calgary Power, and indicates the lengths of distribution and additional transmission lines that may be built by year 2001. The numbers of substations resulting from each alternative are also shown. The economic costs of each alternative were previously presented in Table 1.

TABLE 2
COMPARISON OF APPROXIMATE LENGTHS OF DISTRIBUTION AND TRANSMISSION LINES AND NUMBERS OF SUBSTATION

	Alternative A (CP 787S)	Alternative B (CP 397S)	Alternative C (CP 434S)	Alternative D (CP 787S & 397S)
Total length of overhead 25-kV distribution lines in 2001 (miles)	20.0	11.5	10.5	11.0
Total length of underground 25-kV distribution lines in 2001 (miles)	14.5	18.0	7.0	6.0
Total length of additional 138-kV transmission lines in 2001 (miles, not including CP 739L)	15.5	14.0	15.0	17.5
No. of 138-kV substations in Stony Plain - Spruce Grove area.	1 (CP 787S)	2 (CP 787S & CP 397S)	2 (CP 787S & CP 434S)	2 (CP 787S & CP 397S)

The Board believes that, with respect to overhead distribution lines, the alternative requiring the greatest length of distribution line right of way would have the greatest aesthetic impact. However, the figures shown in Table 2 do not take into account the fact that two or more lines may share the same right of way. This would reduce the effective length of lines in terms of visual impact. Given these limitations only Alternative A has significantly greater lengths of overhead distribution lines. Alternatives B, C, and D have essentially the same lengths, all less than those of Alternative A.

The lengths of additional 138-kV transmission lines shown in Table 2 refer only to future 138-kV lines built to supply the Stony Plain - Devon area (the length of CP 739L applied for in these applications is not included). Also, the use of common right of way could affect the effective lengths of the 138-kV lines; however, the Board does not consider that this possible reduction would be as great for the 138-kV lines. Alternative D would result in greater lengths of 138-kV lines than the other alternatives, which have similar lengths of lines.

With any alternative, there would be a substation at the site of CP 787S serving the Transmountain Pipeline pumping station only, or the Stony Plain - Spruce Grove area as well. Alternative A would have only this one substation site, CP 787S. The other alternatives would require a second substation site, either CP 434S or CP 397S. The Board believes that the trees near the existing substation CP 397S would reduce the visual impact of an expanded CP 397S as compared to that which would result from the applicant's proposed CP 434S. Therefore, with respect to the aesthetic impact of the substations, the Board considers that Alternative A would have the least impact, Alternatives B and D greater impact, and Alternative C the greatest impact.

Summarizing the aesthetic impact, the Board rates Alternatives B, C, and D preferable to Alternative A with respect to 25-kV overhead distribution lines; A, B, and C preferable to D with respect to future 138-kV transmission lines; and A preferable to B and D, which in turn are preferable to C with respect to the number of substations. Given this situation, the Board does not believe that any one of the alternatives is clearly indicated as the most or least preferable from an aesthetic impact viewpoint.

The second item that the Board considered was the expected reliability of the supply provided by each alternative to Stony Plain and Spruce Grove. The single line diagram of CP 434S submitted by the applicant indicates that the transformers supplying the 25-kV distribution circuits fed from the substation could be supplied from either the Transmountain or the Devon end of transmission line CP 739L. The diagram and other information indicates that when the second 138/25-kV transformer is installed at CP 434S, a fault in one of the transformers or on the 138-kV bus could be isolated and the remaining transformer would have adequate capacity to supply all of the 25-kV distribution loads. The Board believes that similar 138/25-kV substations could be built at CP 787S or CP 397S, Alternative A or B respectively, if either one of those substations were to be used alone to supply both Stony Plain and Spruce Grove. Alternative D, using both CP 787S and CP 397S, would separate the source of supply for the town of Stony Plain from that for the town of Spruce Grove. If there were adequate interconnecting 25-kV distribution lines between the two towns, and if each substation alone had adequate capacity to supply both towns, then either one of the substations could be lost completely and service could still be maintained. Under an alternative that establishes only one substation to supply both towns, service to both towns would be interrupted if the single substation were lost. Therefore the Board believes that although the probability of a substation being completely out of service is very low, Alternative D, using two substations, would provide a somewhat higher degree of reliability than the other alternatives.

The Board considers that, all other factors being equal, the length of the overhead 25-kV distribution lines has some effect on the reliability of supply because the longer the lines, the greater the possibility of physical damage to the line. The Board believes that, although underground lines offer greater physical protection, any fault that does occur requires more time to locate and repair. The Board therefore believes that, in this case, the alternatives having the shortest total length of 25-kV distribution lines, both overhead and underground, would be at least somewhat more reliable. As indicated on Table 2 these alternatives would be C and D. Alternatives A and B have significantly longer lengths of 25-kV lines. Since provision would be made for alternative 138-kV supply the Board does not consider the length of future 138-kV lines to be of great importance to reliability.

Considering the number of substations and the length of distribution lines together, the Board believes that the latter factor has the greater effect on reliability, and therefore believes Alternative D to be the most reliable, and Alternative C to be slightly less reliable. Alternatives A and B would be somewhat less reliable than Alternative C.

The third item that the Board considered was the economic cost associated with each alternative. These costs are detailed in Table 1. The Board considers the applicant's figures to be reasonable for the purposes of comparing the alternatives. With respect to the cost of constructing the substations themselves, Alternative D, requiring a 138/25-kV substation at both CP 787S and CP 397S, would be much more costly than the other three alternatives which require only a single substation to supply Stony Plain and Spruce Grove. With respect to the costs of the construction of 25-kV lines and the energy and demand losses on the lines, Alternative A or B would be much more costly than either Alternative C or D. The costs of construction of future 138-kV transmission lines are similar for all alternatives. Combining the four areas of cost, the applicant's proposal to use CP 434S to supply both the towns of Stony Plain and Spruce Grove, Alternative C, is some $175,000 less expensive than Alternative B, some $260,000 less than D, and some $410,000 less than A.

Combining the three areas of comparison: aesthetic impact, reliability, and economic costs, the Board believes that on the basis of reliability and economic costs, Alternative C is clearly superior to Alternatives A and B. Furthermore, the Board does not believe that the somewhat greater reliability of Alternative D as compared to Alternative C justifies the substantially greater cost that would have to be borne by the applicant's customers. Therefore the Board considers the applicant's proposed Alternative C preferable over the other alternatives.

Respecting the second substation proposed by Calgary Power, the Board agrees that with the removal from service of Jasper Place Substation CP 272S, a new substation would be required to supply the rural area between the towns of Spruce Grove and Devon; and, the Board agrees with the applicant's proposed site for this new substation, designated Acheson Substation CP 305S.

5 THE LOCATION OF THE TRANSMISSION LINE AND THE SUBSTATIONS

The proposed transmission line CP 739L would be approximately 27.7 miles in length, running from Transmountain Substation CP 787S, 1 mile north of Stony Plain, to Devon Substation CP 14S in Devon (see Figure 3). The applied-for route is on road allowance for the most part; however, in some areas near Stony Plain and the North Saskatchewan River, the line would be on private property.

The views of the applicant, the interveners and the Board are presented by application beginning at Transmountain Substation CP 787S. The first 4.5 miles are covered by Application No. 7869. This portion of the line runs from CP 787S east and south to the proposed CP 434S. Several alternatives to the preferred route have been presented by the applicant. Application No. 7823 covers the 9 miles of transmission line CP 739L from CP 434S south and east to the proposed CP 305S. No alternatives to this route were presented. The 14.2 miles of the line from CP 305S south and east to CP 14S are covered by Application No. 7913. One alternative route has been presented by the applicant for this section. Both of the proposed substations, CP 434S and CP 305S, are applied for in Application No. 7823.

5.1 Application No. 7869

The application includes that portion of the 138-kV transmission line CP 739L between the existing Transmountain Substation CP 787S, situated approximately 1 mile north of Stony Plain, and the proposed new substation, Stony Plain Substation CP 434S located approximately midway between Stony Plain and Spruce Grove. Several alternative routes were presented by the applicant. Figure 4 is a detailed map of the proposed and alternative routes. In the discussion of Application No. 7869 the letters designating the various routes refer to the letters shown on the map in Figure 4. It should be noted that some of the alternatives proposed involve only small sections of the complete route from CP 787S to CP 434S, although the route finally selected must be continuous between these two substations.

5.11 Views of the Applicant

The applicant has proposed the route marked AGRBEF. In the applicant's view, this route is the most favourable with respect to minimizing the amount of tree clearing required, avoiding conflicts with buildings and roadways, and creating the least possible disruption of the area.

The applicant presented the portion KQR as an alternative to one section of the route. This alternative would situate the line 2 feet north of the north boundary of the Transmountain Pipeline right of way through SW 12-53-28-4. In choosing between this alternative route and the proposed route, the applicant said that it had considered the effect the line would have in dividing the quarter-section. The alternative route follows the pipe line right of way since the pipe line right of way inhibits building construction to some extent anyway. The proposed route would allow buildings between the transmission line and the southern boundary of the quarter-section. Although the applicant proposed the more northerly route, it stated that the alternative route was feasible as well.

The portion GHCJF was considered a viable alternative. The applicant stated that this route is on privately owned, and mostly cultivated land; that about 1,200 feet of tree cutting would be required, much of it near farmsteads; that the line would be more visible from Highway No. 16; and that muskeg near point H would cause an anchoring problem. The advantages of this alternative, in comparison to the proposed route as given by the applicant, are that it would be somewhat more accessible for maintenance and would contain fewer jogs.

The portion KQLMN was not considered a viable alternative by the applicant for the following reasons: farm buildings and windbreaks were close to the road allowance, muskeg would cause problems near point L, the visual impact of the line would be greater, and the Department of Highways planned to widen the road along the 5th Meridian and to build a service road north of Highway No. 16. The Department of Highways' objections were set out in a letter of October 4, 1974. Its letter made reference to aesthetic impact, road widening, the problem of vehicles leaving the road and striking a pole, an increase in car radio interference, and increased problems of road maintenance, snow clearing, and landscaping.

The applicant said that while the alternative portion OPJN would remove the need to cross Section 31-52-27-W4, it would add a crossing to Section 6-53-27-W4, and require much tree clearing along the fence line in that section. The applicant considered the CNR right of way in 31-52-27-W4 a natural corridor to follow. The applicant said that the proposed route leaves the CNR tracks and follows the quarter-section line in the east half of 31-52-27-W4 so as to allow for the development of a heavy industrial subdivision between the transmission line and the railway right of way. According to the applicant this jog in the route was proposed following a request from the owners of this land on which the industrial subdivision may be developed.

5.12 Views of the Interveners

The Bauers (SW 12-53-28-W4) said that locating the transmission line on their land would make farming more difficult and would reduce the value of their land. They also said that the destruction of a part of shelter belt located on their property would increase wind erosion of their cultivated land. Finally, they stated that the proposed route would prevent future subdivision development on their land. In a letter to the Board dated February 13, 1975, the Bauers indicated the future locations of two houses which they proposed to built on their land adjacent to the shelter belt.

Mr. Goertz (SE 1-53-28-W4) objected to the alternative line GHCJF because the line would cross his land and make his farming operations more difficult. He said that it was awkward manoeuvering heavy machinery around transmission line poles.

Mr. Walter, representing Mr. Baron (SW 6-53-27-W4) and Mr. Weitzel (SE 6-53-27-W4), opposed alternative route GHCJF as it would sever his clients' lands and hinder their farming operations. Mr. Walter said that his clients favoured the proposed route, but that, if the alternative route GHCJF were approved, the line should be routed along the east-west quarter line.

Mr. Stratton said that his clients favoured the proposed transmission line route and were very much opposed to alternative route GHCJF, as this route would cross land (SW 6-53-27-W4) on which they hold an option to purchase.

Mr. Gray (S½ 31-52-27-W4), and Mr. Gallant representing Mr. Gray, stated that one of the alternative routes should be chosen since an existing transmission line, CP 36L, already crosses Mr. Gray's land. If the proposed route were approved they asked that it follow the CNR right of way throughout section 31. Mr. Gallant believed that Calgary Power had probably not negotiated strongly enough with the Department of Highways concerning the location of the proposed transmission line on the Highway No. 16 right of way. He also noted that Mr. Gray would oppose the construction of the 138-kV line on the CP 36L right of way through section 31 as this right of way passed between Mr. Gray's residence and his out-buildings.

Mr. Hilliard said that the ERPC would favour the route making greatest use of existing road allowances, and being farthest away from possible major urban developments. He suggested that this route would be AGRBMNF.

5.13 Views of the Board

The Board agrees with the applicant that alternative KQLMNF is not viable. The widening of Highway No. 16 or the addition of service roads on the north side as planned by the Department of Highways would necessitate moving the transmission line. The Board believes that the economic costs involved in moving the line as well as the other disadvantages noted by the applicant outweigh the possible advantages of this route.

The Board believes that portions GHCJ and JNF are viable alternatives; however, as noted by Mr. Goertz and Mr. Walter, the portion HCJ would have some adverse effect on farming operations. Also, the line would be more visible from Highway No. 16 than on other routes.

The Board agrees with the Bauers that both the proposed route KGR, and the alternative route KQR, would affect the Bauers' use of their land. However, in view of the problems that would be created by the other alternative routes in that area, QLMNF and GHCJF, the Board believes that the line should cross SW 12-53-28-W4, the Bauers' land. The Board considers that route KQRB is the preferable route as it follows a straight alignment alongside the pipe line right of way; however, any crossing of SW 12-53-28-W4 agreeable to both the applicant and the Bauers would probably be acceptable to the Board. Therefore the Board requests that the Bauers and the applicant enter into negotiations to consider changes to the route as approved across SW 12-53-28-W4. Any alterations the Bauers and the applicant agree to make with respect to the crossing of the Bauers' land should be reported to the Board before the deadline set out in the Permit and Licence attached as Appendix III.

Regarding the alternative route portion OP, the Board agrees with the applicant that this is not a preferable route because of the amount of tree clearing required on the east-west quarter-section line. Clearing of these trees would increase wind erosion of the cultivated land in section 6-53-27-W4.

The Board believes that the portion of the proposed route BE would be acceptable because it is not close to any buildings and would require a minimal amount of tree clearing. As well, this portion of the route is on the road allowance providing easy access for construction and maintenance.

Assuming that an industrial subdivision would be established south of the CNR right of way in NE 31-52-27-W4, the Board believes that the transmission line should follow the applicant's proposed route through section 31-52-27-W4. However, the Board also believes that minimal tree clearing should be done on the quarter line in the east half of 31-52-27-W4 so as to screen as much as is practical the transmission line and the proposed industrial subdivision from Mr. Gray's residence. Therefore the line should be set on the private land north of the quarter line. In choosing this route over route CJ the Board considered the CNR railway line to be a more established corridor to follow, whereas route CJ would be in the middle of a cultivated field.

In summary, the Board believes that the most preferable route is AKQRBEF, which is the applicant's proposed route except for the portion KQR in SW 12-53-28-4, and the portion in NE 31-52-27-W4 to be located north of the quarter-section line.

5.2 Application No. 7823

The 9-mile portion of CP 739L between the two proposed new substations, Stony Plain Substation CP 434S, and Acheson Substation CP 305S, is covered by this application. Only one route was proposed by the applicant in this section (see Figure 3). This application also covered the construction of the two proposed substations CP 434S and CP 305S.

5.21 Views of the Applicant

No alternative routes were proposed by the applicant for the transmission line between Stony Plain Substation CP 434S and Acheson Substation CP 305S. The route would be south from Substation CP 434S approximately 1.4 miles to the right of way for an existing 69-kV transmission line CP 123L. The proposed transmission line would then follow the CP 123L right of way east to Acheson Substation CP 305S. Transmission line CP 123L would be re-energized at 25 kV and carried as a second circuit on the proposed transmission line.

The applicant noted that special care would be taken in trimming the row of trees on the southern boundary of 29-52-26-W4 and SW 28-52-26-W4. The applicant also noted that either Mr. Gray's or Mr. Gallant's suggested site for CP 434S would result in extra lengths of 25-kV distribution lines.

5.22 Views of the Interveners

The only interveners who objected to this portion of the line were Mr. Gray (S½ 31-52-27-W4 and LSD's 4, 5 SW 32-52-27-W4) and his representative Mr. Gallant. Their objections concerned the location of Stony Plain Substation CP 434S. Mr. Gray said that the proposed location of Substation CP 434S was directly across the road from the entrance to his residence and therefore he would have to pass by the substation frequently. He suggested that Substation CP 434S could be located in SW 30-52-27-W4 where its distance to Stony Plain would be not farther than from the proposed site to Stony Plain. Mr. Gallant made an alternative proposal that Mr. Gray would exchange 5 acres of his land in SW 32-52-27-W4 for the site the applicant owns, and that Substation CP 434S could be located on this exchanged land.

5.23 Views of the Board

Regarding Mr. Gray's proposed location of Substation CP 434S in SW 30-52-27-W4, the Board notes the applicant's statement during the hearing that this location would increase the length of the distribution lines to Spruce Grove. Considering the location of Mr. Gray's feed lot operation, including silos and associated buildings, in SE 31-52-27-W4, the Board does not consider the locating of Substation CP 434S on the site proposed by the applicant to be incompatible with the present use of this particular area. Furthermore, the Board does not believe that the exchange of land proposed by Mr. Gallant would greatly reduce the visual impact of the transmission line and of Substation CP 434S on the area.

The Board agrees with the route as proposed by the applicant, while noting that the applicant would give special consideration to the row of trees in 29-52-26-W4 and SW 28-52-26-W4.

5.3 Application No. 7913

This application covers the section of CP 739L between the proposed Acheson Substation CP 305S and the existing Devon Substation CP 14S in the town of Devon. This section is approximately 14.2 miles in length (see Figure 3).

5.31 Views of the Applicant

The applicant stated that the main consideration in proposing a route between Acheson Substation CP 305S and Devon Substation CP 14S was the Department of Highway's intention to widen Highway No. 60. Thus, through the Stony Plain Indian Reserve where widening would take place on the west side of Highway No. 60, the applicant has proposed that the transmission line be located on the east side of the highway; however, from the south boundary of the Indian Reserve to the North Saskatchewan River, the applicant did not know what additional width would be required for the highway. If the line had to be moved at a future date, say 1980, the estimated typical cost of moving a 5-mile section of 138-kV line would be approximately $85,000 (based on 12 per cent per year cost escalation). The estimated initial cost of constructing the same 5-mile section of 138-kV line was given as approximately $130,000 (in 1975). The applicant proposed therefore to route the transmission line east for 1 mile at the south boundary of the Indian Reserve and then south along the road allowance parallel to and 1 mile east of Highway No. 60 from the Indian Reserve to the North Saskatchewan River.

The applicant did propose as a possible alternative the continuation of the transmission line south along Highway No. 60 from the south boundary of the Stony Plain Indian Reserve to the northwest corner of NW 3-51-26-W4. At this point the proposed alternative route would turn east for 1 mile to join the applicant's preferred route. The applicant stated that the main disadvantage of the alternative route would be the conflict with the widening of Highway No. 60, as previously detailed. The applicant also noted that if the transmission line were set well back from the highway, then the line would have to be constructed on private property. One advantage of the alternative route would be the greater ease of construction and maintenance of the transmission line.

The applicant said that the location of the river valley crossing had been chosen so that it would not be highly visible from Highway No. 60. The applicant stated that the trees at the proposed crossing would serve to camouflage the crossing structures. Furthermore the applicant noted that there are few trees near the Highway No. 60 bridge and that the crossing structures, if erected near the bridge, would be much more visible.

The applicant said that the use of the CP 75L right of way would be feasible, but, because of the extra length involved this route would be a third choice after the preferred and alternative routes. Also the applicant noted that separate river crossing structures would be required for each transmission line.

5.32 Views of the Interveners

Mr. Bellingham, representing Sigma Lands (NE 22-51-26-W4), noted that in Sigma Lands' written submission, Mr. V.R.Nyberg said that the unsightliness of the line would reduce the value of the land near the route. Mr. Nyberg also suggested that the transmission line would probably increase TV and radio interference. He suggested that the alternative route be followed.

Mrs. Kapty (SW 35-51-26-W4 and NE 27-51-26-W4) also expressed the view that the line should be located adjacent to Highway No. 60 because the aesthetic appeal of the area would be reduced if the applicant's preferred route were followed and because of the tree cutting required on the preferred route. She noted that the Highway No. 60 route was being used through the Stony Plain Indian Reserve.

Mr. Agrios said that his client's land (14-51-26-W4) was being kept in a natural state and that the route proposed by Calgary Power was partially along an unopened road allowance bordering this land. He suggested that the line should not follow the proposed route so that the natural condition of the land could be preserved. He also suggested that, because of muskeg in the area, construction would be very difficult along the unopened road allowance. Mr. Agrios said that, since the Highway No. 60 right of way was suitable through the Indian Reserve, it should also be suitable for the entire distance south to the North Saskatchewan River. He said that, as far as the safety question was concerned, poles adjacent to a country road are at least as dangerous as poles along a major highway. Mr. Agrios also suggested that consideration be given to using the existing CP 75L right of way, and to constructing a river crossing east of Devon.

Mr. Hilliard said the ERPC was proposing the route along Highway No. 60 because there would be less residential development along the highway than along the applicant's proposed route. The route on the west boundary of Section 33-50-26-W4 was proposed so as to allow for the planned development of this section without the hindrance of the transmission line on the north-south centre line. The ERPC had no suggestions as to the location of the river crossing.

Mr. Bailey said that the County of Parkland agreed with the route proposed by the ERPC, and went on to suggest a river crossing at the north-south quarter line of section 3-51-26-W4. The County of Parkland No. 31, in its written submission states that construction and maintenance of the line along Highway No. 60 would be easier. It also stated that if the line is built on the proposed route radio and TV interference would be caused.

Mr. Hutchison (part of 32-50-26-W4) did not object to the proposed route, but noted that he would like to be informed of any river crossing suggested near the Highway No. 60 bridge.

Mr. Rowand and Mr. Polanski (part of NE 14-52-26-W4) questioned the electrical interference of the 138-kV line and its effect on the QCTV receiver. They seemed to agree with the applicant's contention that the suspension type insulators proposed for this line would reduce the interference compared to pin-type insulators. They stressed, however, that Calgary Power should maintain the line in good condition to ensure continued low interference levels. Mr. Polanski said that when QCTV had constructed its receiver it was not aware of the proposal to subdivide and develop portions of the Indian Reserve.

5.33 Views of the Board

The Board notes the objections of the interveners to the proposed route and agrees that the aesthetic impact of the proposed line on the permanent residents of this area would be greater than that of the alternative route along Highway No. 60. Although the Board notes that a considerable expense would be incurred if the line were constructed adjacent to Highway No. 60, and later had to be moved to allow for highway expansion, the Board believes that the line should follow the alternative route along Highway No. 60 and should be constructed on the existing road allowance as stated in the application.

The Board agrees with the applicant's proposed river crossing and proposed route from the river to Devon Substation CP 14S. Because of the greater tree cover, and the greater distance from the bridge, the proposed river crossing would have less visual impact than a crossing at a location near the Highway No. 60 bridge. The Board does not agree with the ERPC contention that the proposed route would unduly hamper development of Section 33-50-26-4, west of Devon. Also, the ERPC's proposed route does not include a river crossing site, although it would probably have to be near the Highway No. 60 bridge.

The Board notes that aesthetically there would be some merit in constructing as much of CP 739L as possible on the existing CP 123L and CP 75L rights of way east and south of CP 305S to CP 14S at Devon. However, the existing route of CP 75L through the town of Devon could not be used for the 138-kV line and the Board believes that the economic costs of the approximately four extra miles of 138-kV transmission line thus required to by-pass Devon outweigh the merits of this route.

The Board believes that the questions raised by Mr. Rowand and Mr. Polanski regarding interference with their TV signal reception were answered satisfactorily by the applicant. The Board expects that the applicant would maintain CP 739L in such condition that QCTV's signal reception, as well as local TV and radio reception, would not be significantly affected.

In summary, the Board believes that the route of transmission line CP 739L between Acheson Substation CP 305S and Devon Substation CP 14S should be the applicant's alternative route, which differs from the preferred in the area between the Stony Plain Indian Reserve and the North Saskatchewan River.

6 MINISTERIAL APPROVAL

The Hydro and Electric Energy Act, section 10, subsection (1), provides that the Board shall refer an application for a permit to the Minister of the Environment and the Minister of Lands and Forests for their approval of the application as it affects matters of the environment.

The Board, in compliance with the above, has referred the subject applications to the Minister of the Environment and the Minister of Lands and Forests and they have given their approval of the applications. Accordingly, their respective approvals have been incorporated as Appendices B and C to the Board's proposed Permits and Licences No. CP 75-11, CP 75-12, and CP 75-13 set out in Appendices I, II, and III to this report, and the Board has made its permits subject to the same conditions imposed by the Minister of the Environment and the Acting Minister of Lands and Forests in their approvals.

7 DECISION

Having regard for its responsibilities under The Hydro and Electric Energy Act, and subject to the approval of the Minister of the Environment with respect to matters affecting the environment, the Board is prepared to issue permits and licences for the construction and operation of the 138-kV transmission line, CP 739L; and the two 138/25-kV substations, Stony Plain Substation CP 434S and Acheson Substation CP 305S. The Board is also prepared to issue approvals for discontinuing the operation of and salvaging existing transmission lines and substations as requested by the applicant.

These permits and licences, and approvals would be in the forms set out in Appendices I, II, III, IV, V, VI, and VII and subject to the terms, conditions, and alterations to the applicant's preferred route contained therein.

G.J. DeSorcy

G.J. DeSorcy
Board Member

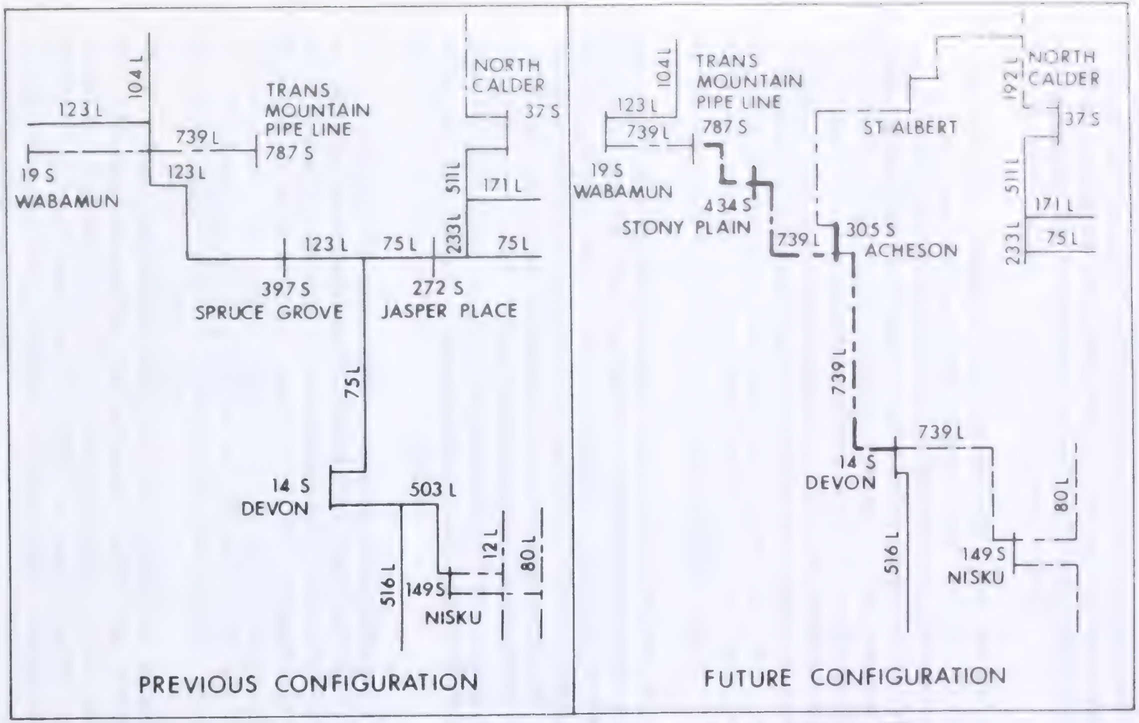


FIGURE 1 – STONY PLAIN – NISKU PROJECT
SINGLE LINE DIAGRAM

LEGEND

19S ⊢ SUBSTATION

75L —— 69 kV TRANSMISSION LINE

12L – – – 138 kV TRANSMISSION LINE

739L 434S –+– SECTION OF THE PROJECT APPLIED FOR UNDER APPLICATIONS No. 7869, 7823, 7913

NOTE: 1. THE LETTERS "CP" WHICH PRECEED TRANSMISSION LINE AND SUBSTATION NUMBERS IN THE TEXT HAVE BEEN OMITTED.

2. THE SINGLE LINE DIAGRAM IS A SIMPLIFIED REPRESENTATION OF THE TRANSMISSION LINE CONFIGURATION, AND IS NOT INTENDED TO BE ACCURATE ELECTRICALLY OR PHYSICALLY.

ENERGY RESOURCES CONSERVATION BOARD
CALGARY ALBERTA

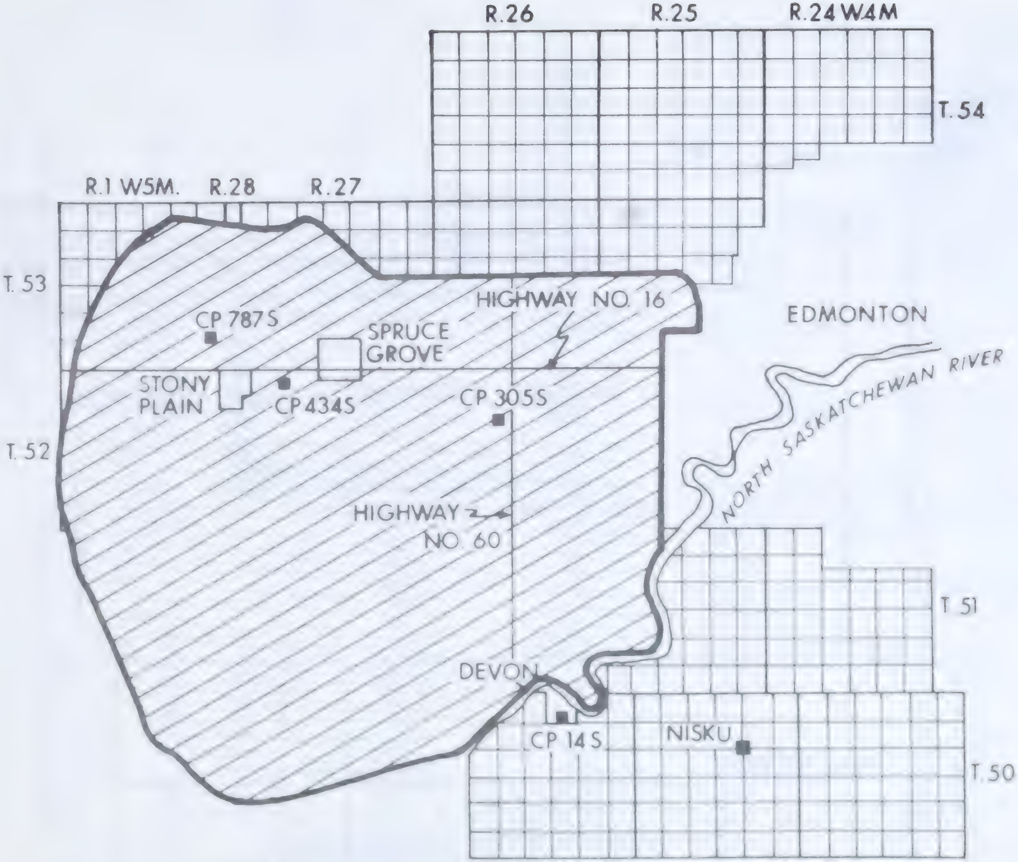


FIGURE 2 - AREA SERVED IN THE STONY PLAIN - DEVON REGION

ENERGY RESOURCES CONSERVATION BOARD
CALGARY, ALBERTA

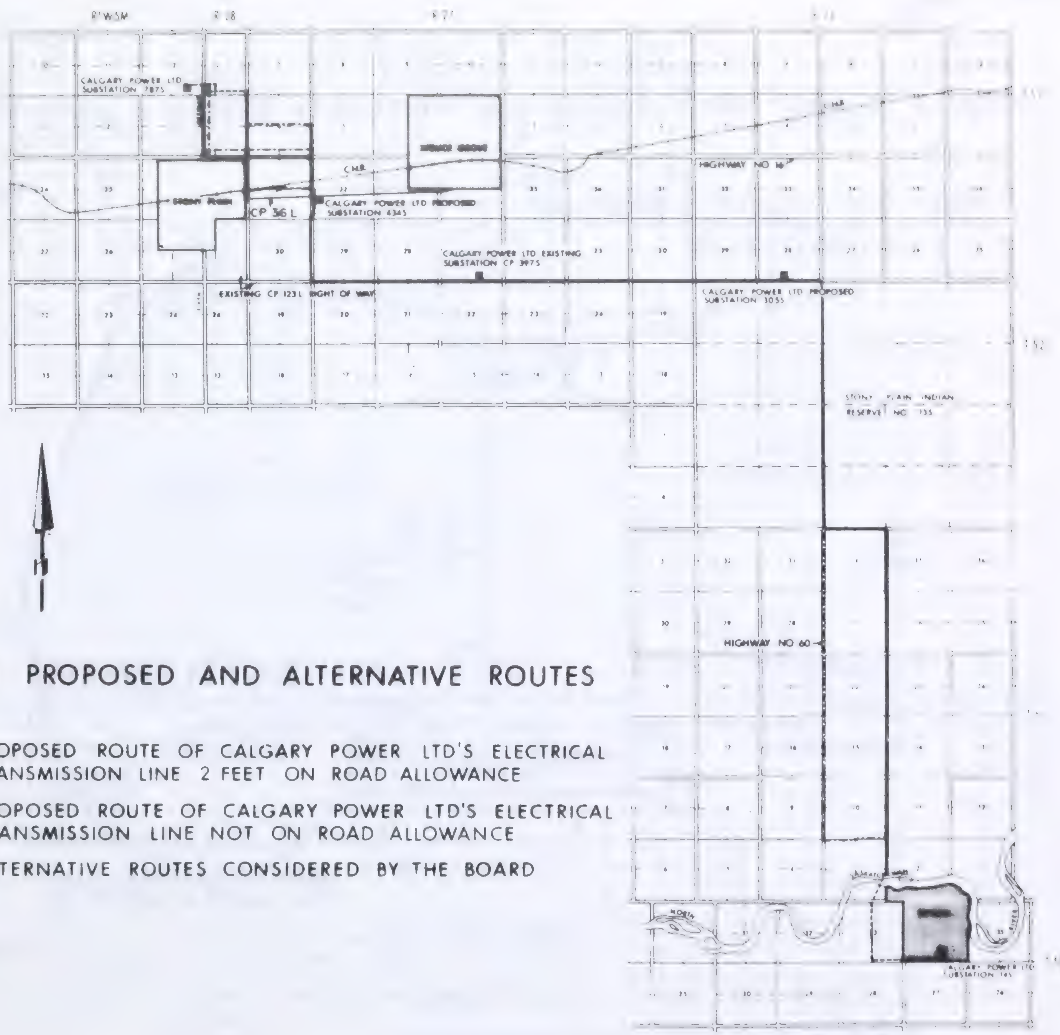


FIGURE - 3 PROPOSED AND ALTERNATIVE ROUTES

—— PROPOSED ROUTE OF CALGARY POWER LTD'S ELECTRICAL TRANSMISSION LINE 2 FEET ON ROAD ALLOWANCE

- - - - - PROPOSED ROUTE OF CALGARY POWER LTD'S ELECTRICAL TRANSMISSION LINE NOT ON ROAD ALLOWANCE

-·-·- ALTERNATIVE ROUTES CONSIDERED BY THE BOARD

ENERGY RESOURCES CONSERVATION BOARD
CALGARY ALBERTA

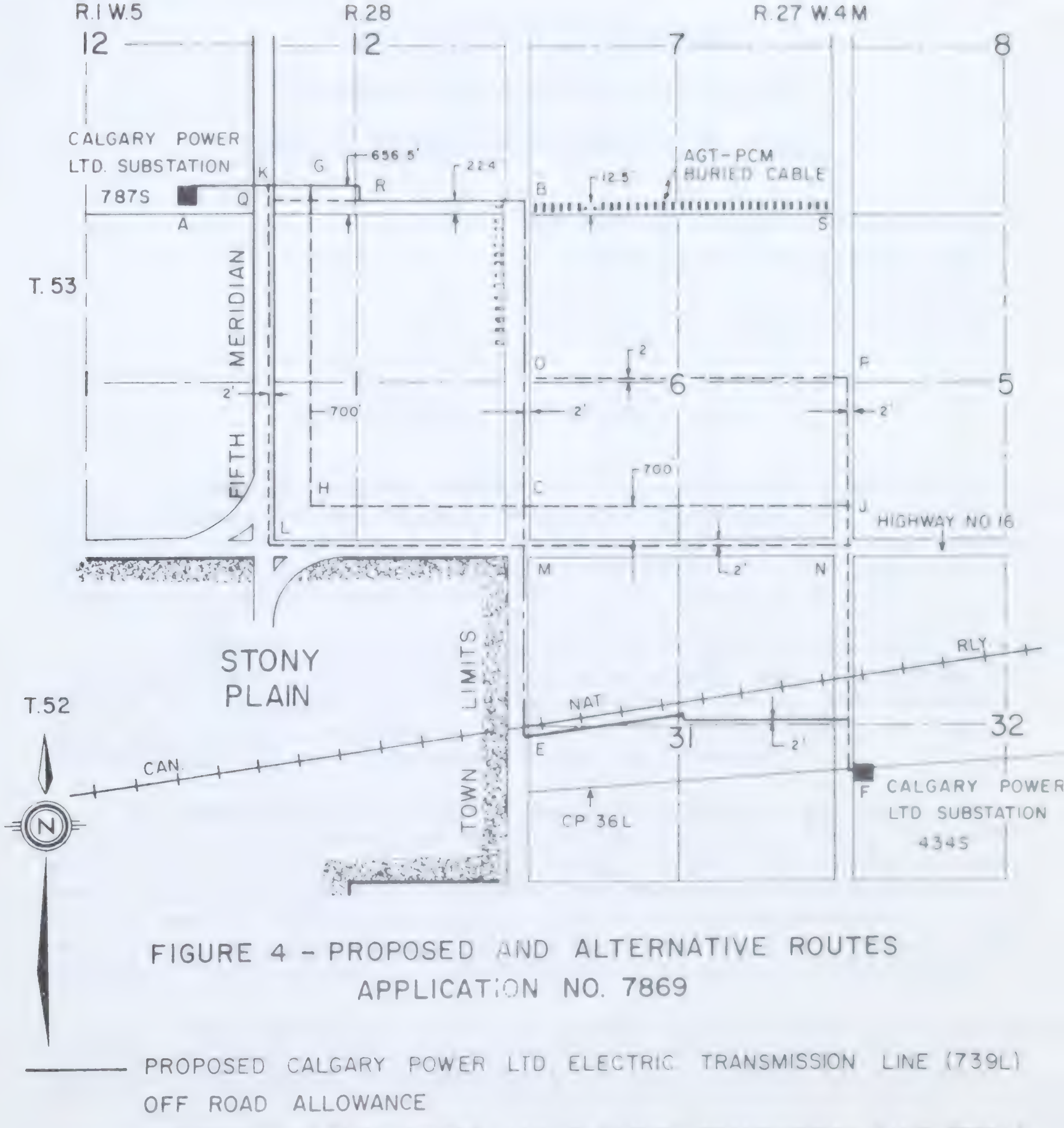


FIGURE 4 - PROPOSED AND ALTERNATIVE ROUTES
APPLICATION NO. 7869

——— PROPOSED CALGARY POWER LTD ELECTRIC TRANSMISSION LINE (739L) OFF ROAD ALLOWANCE

—·—·— PROPOSED CALGARY POWER LTD ELECTRIC TRANSMISSION LINE (739L) 2 FEET ON ROAD ALLOWANCE

- - - - - - ALTERNATIVE ROUTES CONSIDERED

ENERGY RESOURCES CONSERVATION BOARD
CALGARY ALBERTA

APPENDIX I

FORM OF PERMIT AND LICENCE

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of a Permit and
Licence to Calgary Power Ltd.
authorizing the construction
and operation of a transmission
line in the Spruce Grove Area

PERMIT AND LICENCE NO. ________

WHEREAS Calgary Power Ltd. by application dated May 24, 1974, applied to the Energy Resources Conservation Board for a Permit to construct and a Licence to operate a transmission line designated as Stony Plain Substation CP 434S, (hereinafter called "the Substation") in the Spruce Grove area; and

WHEREAS the Board is prepared to grant the application, subject to the conditions herein contained, and the Minister of the Environment and Acting Minister of Lands and Forests have given their approval, hereto attached, insofar as the application affects matters of the environment.

THEREFORE, the Energy Resources Conservation Board, pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, hereby grants to Calgary Power Ltd. (hereinafter called "the Operator") a PERMIT to construct and a LICENCE to operate Stony Plain Substation CP 434S subject to the provisions of the Act and regulations and orders pursuant thereto and to the following terms and conditions:

1. The Substation shall be wholly located in the South-West Quarter of Section 32, Township 52, Range 27, West of the 4th Meridian, as shown on Appendix A to this Permit and Licence.

2. Specifications of the substation shall be and include as follows:

   (a) one - 138/25 kV transformer,

   (b) one - 25 kV voltage regulator,

(c) two - 138 kV circuit breakers,

(d) three - 25 kV circuit breakers,

(e) associated station service equipment,

(f) a chain link fence surrounding the equipment,

and as more particularly described in an application to the Board from the Operator, dated May 24, 1974.

3. The Operator shall satisfy the Board within 30 days of the completion of the construction of the Substation that such construction has been in accordance with the provisions of this Permit and Licence and The Electrical Protection Act and regulations and orders pursuant to that Act.

4. The Operator shall notify the Board, within 30 days of the time that the Substation is first energized, that the Substation has been energized and is operating within a specified voltage range.

5. This Permit and Licence, insofar as it pertains to matters of the Environment, is subject to the approval of the Minister of the Environment, hereto attached as Appendix B, and to the terms and conditions therein contained.

6. This Permit and Licence, insofar as it pertains to matters of the environment, is subject to the approval of the Acting Minister of Lands and Forests, hereto attached as Appendix C, and to the terms and conditions therein contained.

7. (1) Subject to subclause (2), the Operator shall satisfy the Board within one year of the date hereof that construction of the Substation as permitted herein has been completed.

(2) The Board, on its own motion or upon the application of an interested party, may stipulate such later date by which construction of the Substation is to be completed, as it may consider suitable under the circumstances.

8. The Board may

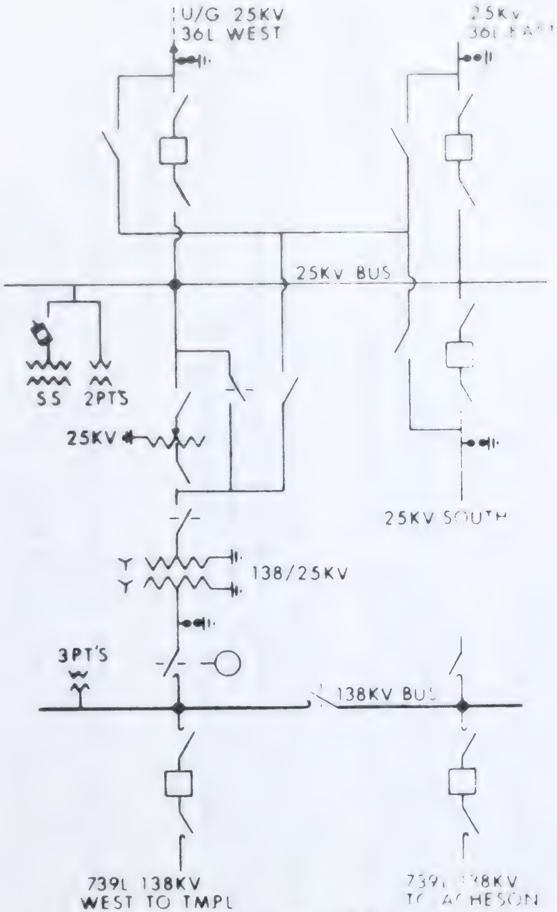
(a) cancel or suspend this Permit and Licence, in whole or in part, for failure of the Operator to comply with any provision of the Act, the regulations, or the terms and conditions set out herein, or

(b) amend this Permit and Licence as it deems suitable in the circumstances.

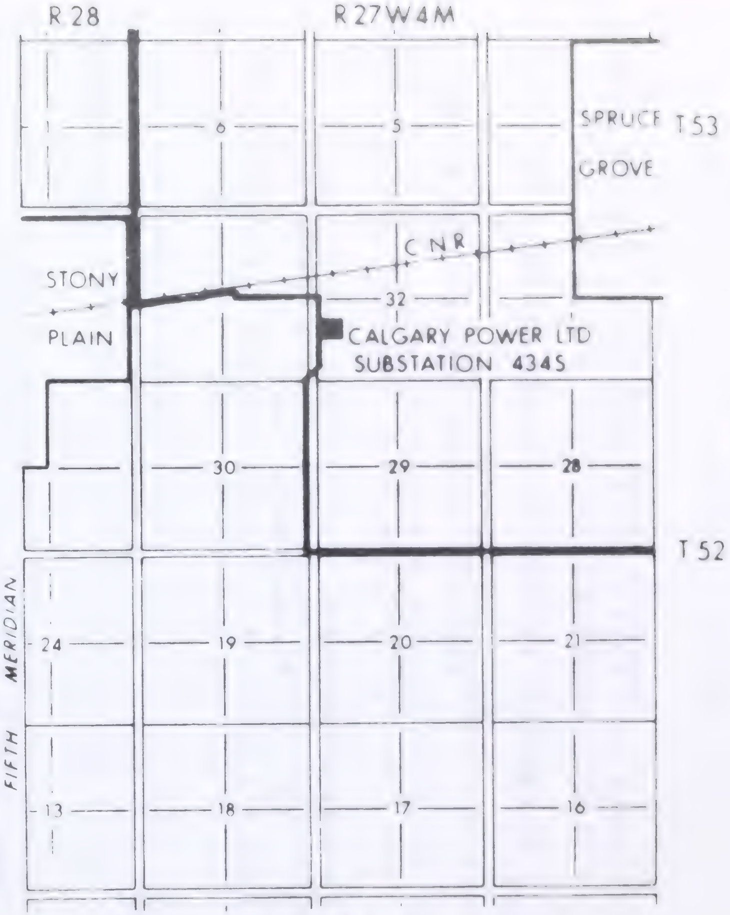
MADE at the City of Calgary, in the Province of Alberta, this

ENERGY RESOURCES CONSERVATION BOARD

G. J. DeSorcy
Board Member



SINGLE LINE DIAGRAM



LOCATION

APPENDIX A TO PERMIT AND LICENCE

NERGY RESOURCES CONSERVATION BOARD
CALGARY ALBERTA

APPENDIX B TO PERMIT AND LICENCE NO. ____

Department of the Environment

MINISTERIAL APPROVAL

No.   ERCB

Edmonton, Alberta
1975

Pursuant to section 10 of The Hydro and Electric Energy Act, I, D.J. Russell, Minister of the Environment, hereby approve Application No. 7823, dated May 24, 1974, from Calgary Power Ltd. to the Energy Resources Conservation Board, in the matter of the construction of Stony Plain Substation CP 434S, insofar as it affects matters of the environment.

____
MINISTER OF THE ENVIRONMENT

APPENDIX C TO PERMIT AND LICENCE NO. ______

Department of Lands and Forests

MINISTERIAL APPROVAL

No. ERCB

Edmonton, Alberta
1975

Pursuant to section 10 of The Hydro and Electric Energy Act, I the undersigned, Acting Minister of Lands and Forests, hereby approve Application No. 7823, dated May 24, 1974 from Calgary Power Ltd. to the Energy Resources Conservation Board, in the matter of the construction of Stony Plain Substation CP 434S, insofar as it affects matters of the environment.

ACTING MINISTER OF LANDS AND FORESTS

APPENDIX II

FORM OF PERMIT AND LICENCE

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of a Permit and Licence to Calgary Power Ltd. authorizing the construction and operation of a transmission line in the Spruce Grove Area

PERMIT AND LICENCE NO. ________

WHEREAS Calgary Power Ltd. by application dated May 24, 1974, applied to the Energy Resources Conservation Board for a Permit to construct and a Licence to operate a transmission line designated as Substation CP 305S (hereinafter called "the Substation") in the Spruce Grove area; and

WHEREAS the Board is prepared to grant the application, subject to the conditions herein contained, and the Minister of the Environment and Acting Minister of Lands and Forests have given their approval, hereto attached, insofar as the application affects matters of the environment.

THEREFORE, the Energy Resources Conservation Board, pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, hereby grants to Calgary Power Ltd. (hereinafter called "the Operator") a PERMIT to construct and a LICENCE to operate Acheson Substation CP 305S subject to the provisions of the Act and regulations and orders pursuant thereto and to the following terms and conditions:

1. The Substation shall be wholly located in the South-West Quarter of Section 28, Township 52, Range 26, West of the 4th Meridian, as shown on Appendix A to this Permit and Licence.

2. Specifications of the Substation shall be and include as follows:

(a) one - 138/25 kV transformer,

(b) one - 25 kV voltage regulator,

(c) one - 25 kV circuit breaker,

(d) associated station service equipment,

(e) a chain link fence surrounding the equipment,

and as more particularly described in an application to the Board from the Operator, dated May 24, 1974.

3. The Operator shall satisfy the Board within 30 days of the completion of the construction of the Substation that such construction has been in accordance with the provisions of this Permit and Licence and The Electrical Protection Act and regulations and orders pursuant to that Act.

4. The Operator shall notify the Board, within 30 days of the time that the Substation is first energized, that the Substation has been energized and is operating within a specified voltage range.

5. This Permit and Licence, insofar as it pertains to matters of the Environment, is subject to the approval of the Minister of the Environment, hereto attached as Appendix B, and to the terms and conditions therein contained.

6. This Permit and Licence, insofar as it pertains to matters of the environment, is subject to the approval of the Acting Minister of Lands and Forests, hereto attached as Appendix C, and to the terms and conditions therein contained.

7. (1) Subject to subclause (2), the Operator shall satisfy the Board within one year of the date hereof that construction of the Substation as permitted herein has been completed.

(2) The Board, on its own motion or upon the application of an interested party, may stipulate such later date by which construction of the Substation is to be completed, as it may consider suitable under the circumstances.

8. The Board may

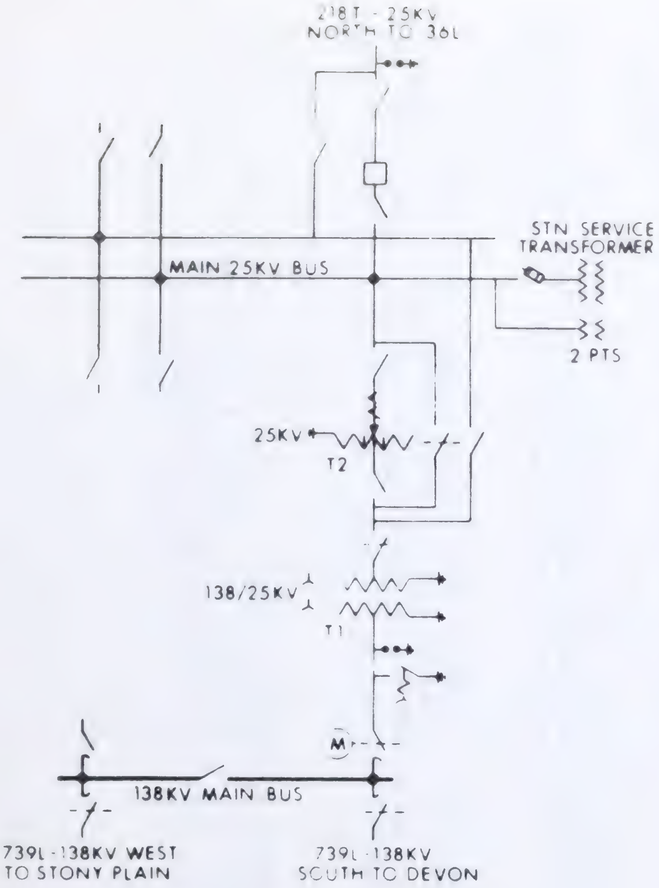
(a) cancel or suspend this Permit and Licence, in whole or in part, for failure of the Operator to comply with any provision of the Act, the regulations, or the terms and conditions set out herein, or

(b) amend this Permit and Licence as it deems suitable in the circumstances.

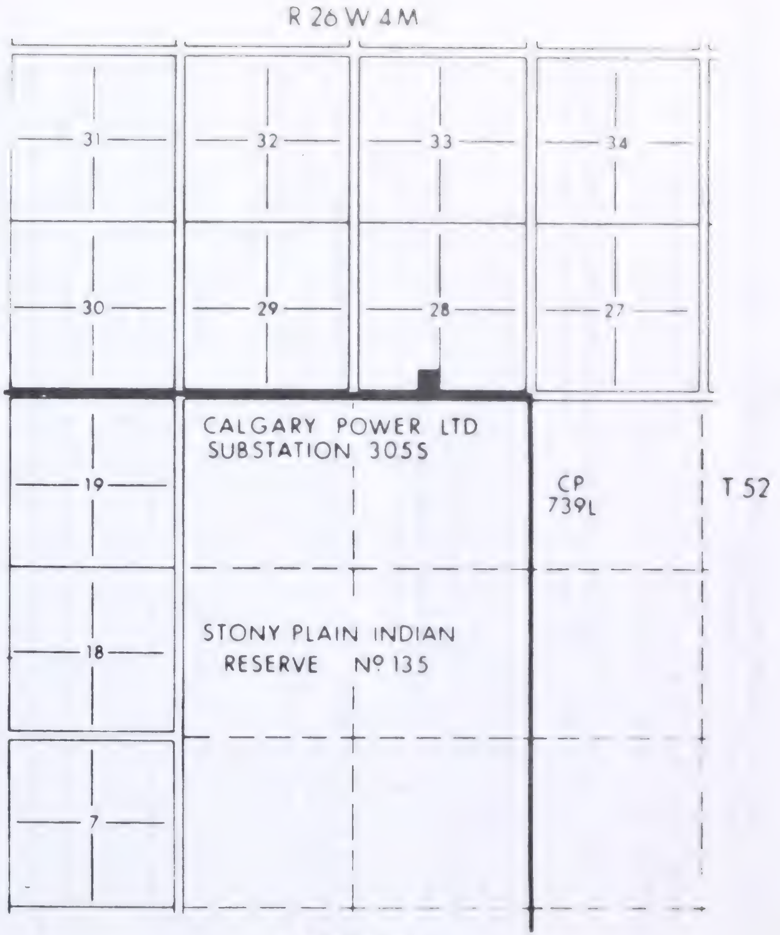
MADE at the City of Calgary, in the Province of Alberta, this

ENERGY RESOURCES CONSERVATION BOARD

G. J. DeSorcy
Board Member



SINGLE LINE DIAGRAM



LOCATION

APPENDIX A TO PERMIT AND LICENCE

ENERGY RESOURCES CONSERVATION BOARD
CALGARY ALBERTA

APPENDIX B TO PERMIT AND LICENCE NO. ____

Department of the Environment

MINISTERIAL APPROVAL

No. ERCB

Edmonton, Alberta
1975

Pursuant to section 10 of The Hydro and Electric Energy Act, I, D.J. Russell, Minister of the Environment, hereby approve Application No. 7823, dated May 24, 1974, from Calgary Power Ltd. to the Energy Resources Conservation Board, in the matter of the construction of Acheson Substation CP 305S, insofar as it affects matters of the environment.

MINISTER OF THE ENVIRONMENT

APPENDIX C TO PERMIT AND LICENCE NO. _____

Department of Lands and Forests

MINISTERIAL APPROVAL

No. ERCB

Edmonton, Alberta
1975

Pursuant to section 10 of The Hydro and Electric Energy Act, I, the undersigned, Acting Minister of Lands and Forests, hereby approve Application No. 7823, dated May 24, 1974 from Calgary Power Ltd. to the Energy Resources Conservation Board, in the matter of the construction of Acheson Substation CP 305S, insofar as it affects matters of the environment.

ACTING MINISTER OF LANDS AND FORESTS

APPENDIX III

FORM OF PERMIT AND LICENCE

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of a Permit and Licence to Calgary Power Ltd. authorizing the construction and operation of a transmission line in the Stony Plain-Devon Area

PERMIT AND LICENCE NO. ______

WHEREAS Calgary Power Ltd. applied to the Energy Resources Conservation Board for a Permit to construct and a Licence to operate a transmission line designated as CP 739L in the Stony Plain-Devon Area; and

WHEREAS the Board is prepared to grant the application, subject to the conditions herein contained, and the Minister of the Environment and Acting Minister of Lands and Forests have given their approval, hereto attached, insofar as the application affects matters of the environment.

THEREFORE, the Energy Resources Conservation Board, pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, hereby grants to Calgary Power Ltd. (hereinafter called "the Operator") a PERMIT to construct and a LICENCE to operate transmission line CP 739L subject to the provisions of the Act and regulations and orders pursuant thereto and to the following terms and conditions:

1. Subject to clause 2 hereof, the route of the transmission line shall be as shown on the attachment hereto, marked as Appendix A to this Permit and Licence.

2. (1) The route of the transmission line prescribed by clause 1 hereof, as such is situated in the South-west quarter of Section 12, Township 53, Range 28, West of the 4th Meridian, subject to the prior agreement of the owners

and occupants of the said lands and with the prior approval of the Board may, within the said lands, be varied or modified.

(2) An application to the Board for approval to vary or modify the route of the transmission line in accordance with subclause (1) hereof shall be made not later than 30 days of the date hereof.

(3) The route of the transmission line in the Northeast quarter of Section 31, Township 52, Range 27, West of the 4th Meridian shall be situated sufficiently far north of the east-west quarter section line so as to eliminate the necessity of tree cutting and clearing on the east-west quarter section line.

(4) The route of the transmission line and right of way therefor shall, insofar as the same is not inconsistent with the provisions hereof, be in accordance with the applications of the Operator to the Board, dated May 24, 1974, June 14, 1974 and July 5, 1974 and evidence given at the hearing of the said applications on October 22, 1974.

3. Specifications of the transmission line shall be and include as follows:

(a) all structures to be of wood pole construction,

(b) the line to be designed and built for operation at 138 kV,

(c) the line to be operated at a nominal 138 kV,

and as more particularly described in applications to the Board from the Operator, dated May 24, 1974, June 14, 1974, and July 5, 1974.

4. The Operator shall satisfy the Board within 30 days of the completion of the construction of the transmission line that such construction has been in accordance with the provisions of this Permit and Licence and The Electrical Protection Act and regulations and orders pursuant to that Act.

5. The Operator shall notify the Board, within 30 days of the time that the transmission line is first energized, that the transmission line has been energized and is operating within a specified voltage range.

6. This Permit and Licence, insofar as it pertains to matters of the Environment, is subject to the approval of

the Minister of the Environment, hereto attached as Appendix B, and to the terms and conditions therein contained.

7. This Permit and Licence, insofar as it pertains to matters of the environment, is subject to the approval of the Acting Minister of Lands and Forests, hereto attached as Appendix C, and to the terms and conditions therein contained.

8. (1) Subject to subclause (2), the Operator shall satisfy the Board within one year of the date hereof that construction of the transmission line as permitted herein has been completed.

(2) The Board, on its own motion or upon the application of an interested party, may stipulate such later date by which construction of the transmission line is to be completed, as it may consider suitable under the circumstances.

9. The Board may

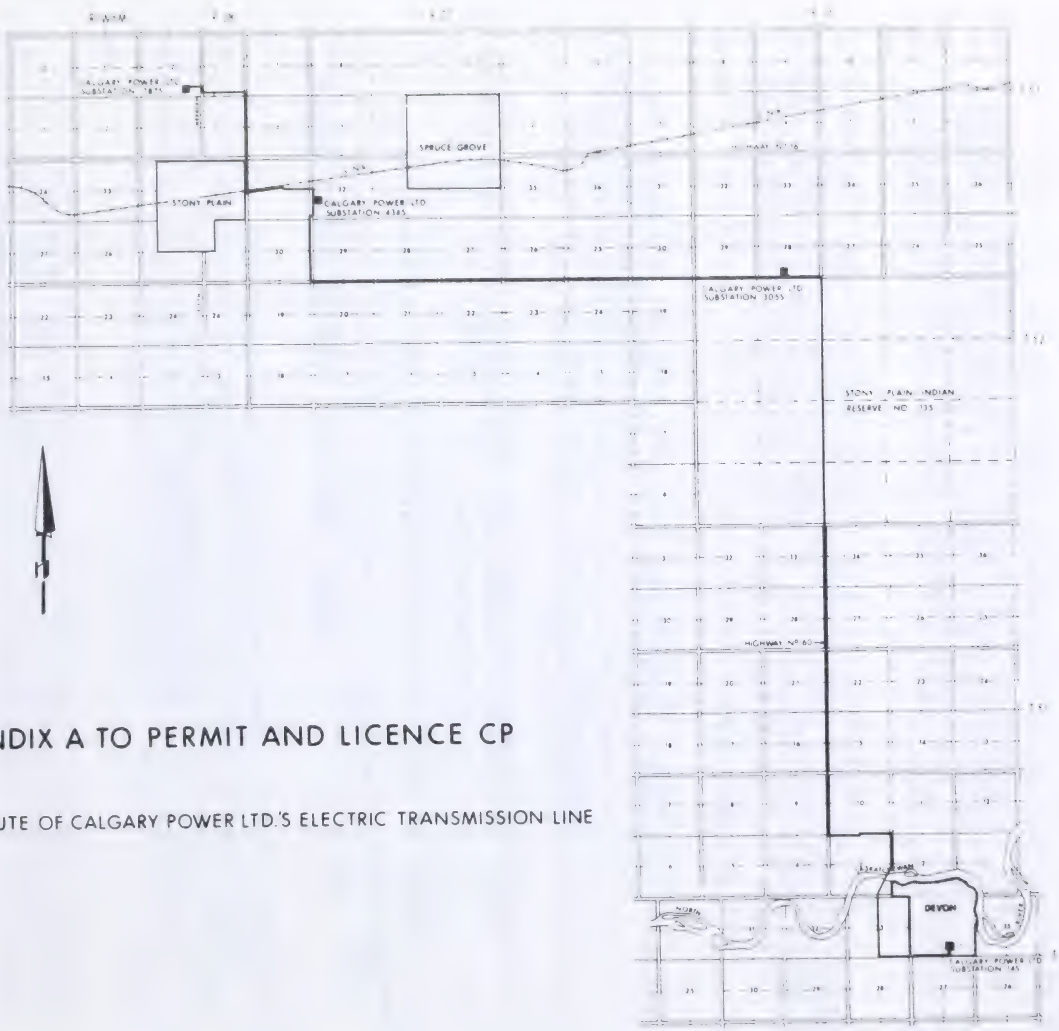
(a) cancel or suspend this Permit and Licence, in whole or in part, for failure of the Operator to comply with any provision of the Act, the regulations, or the terms and conditions set out herein, or

(b) amend this Permit and Licence as it deems suitable in the circumstances.

MADE at the City of Calgary, in the Province of Alberta, this

ENERGY RESOURCES CONSERVATION BOARD

G. J. DeSorcy
Board Member



APPENDIX A TO PERMIT AND LICENCE CP

—— ROUTE OF CALGARY POWER LTD.'S ELECTRIC TRANSMISSION LINE

ENERGY RESOURCES CONSERVATION BOARD
CALGARY ALBERTA

APPENDIX B TO PERMIT AND LICENCE NO. ____

Department of the Environment

MINISTERIAL APPROVAL

No. ERCB

Edmonton, Alberta
1975

Pursuant to section 10 of The Hydro and Electric Energy Act, I, D.J. Russell, Minister of the Environment, hereby approve Applications No. 7823, 7869, and 7913, dated May 24, 1974, June 14, 1974, and July 5, 1974, respectively from Calgary Power Ltd. to the Energy Resources Conservation Board, in the matter of the construction of transmission line CP 739L, insofar as it affects matters of the environment.

MINISTER OF THE ENVIRONMENT

APPENDIX C TO PERMIT AND LICENCE NO. _____

Department of Lands and Forests

MINISTERIAL APPROVAL

No. ERCB

Edmonton, Alberta
1975

Pursuant to section 10 of The Hydro and Electric Energy Act, I, the undersigned, Acting Minister of Lands and Forests, hereby approve Applications No. 7823, 7869, and 7913, dated May 24, 1974, June 14, 1974, and July 5, 1974 respectively, from Calgary Power Ltd. to the Energy Resources Conservation Board, in the matter of the construction of transmission line CP 739L, insofar as it affects matters of the environment.

ACTING MINISTER OF LANDS AND FORESTS

APPENDIX IV

FORM OF APPROVAL

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of an Approval to Calgary Power Ltd. authorizing the discontinued operation of a transmission line in the Edmonton - Stony Plain Area

APPROVAL NO.

WHEREAS Calgary Power Ltd., by application dated May 24, 1974, applied to the Energy Resources Conservation Board for approval to discontinue operation of a transmission line in the Edmonton - Stony Plain area.

THEREFORE, the Energy Resources Conservation Board pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, hereby orders as follows:

1. Approval is hereby granted to Calgary Power Ltd. to discontinue operation of that portion of a transmission line, designated as CP 123L, at a nominal voltage level of 69 kV, extending from its junction with Calgary Power Ltd.'s transmission line CP 104L, located in the South-west quarter of Section 17, Township 53, Range 1, West of the 5th Meridian to its junction with Calgary Power Ltd.'s transmission line CP 75L, located in the South-west quarter of Section 30, Township 52, Range 25, West of the 4th Meridian.

2. Calgary Power Ltd. shall notify the Board within 30 days of the time that the operation of transmission line CP 123L has been discontinued at a nominal voltage level of 69 kV.

3. The Board may,

   (a) upon its own motion, or

   (b) upon the application of an interested person, rescind this Approval at any time.

MADE at the City of Calgary, in the Province of Alberta, this

ENERGY RESOURCES CONSERVATION BOARD

G. J. DeSorcy
Board Member

APPENDIX V

FORM OF APPROVAL

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of an Approval
to Calgary Power Ltd. authori
ing the discontinued operatio
of a transmission line in the
Edmonton - Devon Area

APPROVAL NO. _____

WHEREAS Calgary Power Ltd., by application dated July 1974, applied to the Energy Resources Conservation Board for approval to discontinue operation of a transmission line in t Edmonton - Devon Area.

THEREFORE, the Energy Resources Conservation Board pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, hereby orders as follows

1. Approval is hereby granted to Calgary Power Ltd. to:

   (a) discontinue operation of that portion of a transmission line, designated as CP 75L, at a nominal voltage level of 69 kV, extending from its junction with Edmonton Power's transmission line EP 233L located in the South-west quarter of Section 27, Township 52, Range 25, West of the 4th Meridian to the Calgary Power Ltd.'s Substation CP 14S, located in the Southeast quarter of Section 34, Township 50, Range 26, West of the 4th Meridian; and

   (b) salvage the portion of transmission line CP 75L that is in Section 28, Township 52, Range 25, West of the 4th Meridian.

2. Calgary Power Ltd. shall notify the Board within 30 days of the time that the operation of transmission line CP 75L has been discontinued at a nominal voltage level of 69 kV.

3. The Board may,

   (a) upon its own motion, or

   (b) upon the application of an interested person,

rescind this Approval at any time.

MADE at the City of Calgary, in the Province of Alberta, this

ENERGY RESOURCES CONSERVATION BOARD

G. J. DeSorcy
Board Member

APPENDIX VI

FORM OF APPROVAL

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of an Approval to Calgary Power Ltd. authorizing the discontinued operation and salvaging of a transmission line in the Spruce Grove Area

APPROVAL NO.

WHEREAS Calgary Power Ltd., by application dated May 24, 1974, applied to the Energy Resources Conservation Board, for approval to remove from service and salvage a transmission line in the Spruce Grove Area.

THEREFORE, the Energy Resources Conservation Board, pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, hereby order as follows:

1. Approval is hereby granted to Calgary Power Ltd. to

   (a) discontinue operation of a transmission line designated as "Spruce Grove Substation CP 397S" (hereinafter called "the substation"), located in the South-west quarter of Section 27, Township 52, Range 27, West of the 4th Meridian, and

   (b) dismantle and salvage the works and installations associated with the substation.

2. Calgary Power Ltd. shall notify the Board within 30 days of the time that the operation of Spruce Grove Substation CP 397S has been discontinued.

3. The Board may,

   (a) upon its own motion, or

   (b) upon the application of an interested person, rescind or amend the Approval at any time.

MADE at the City of Calgary, in the Province of Alberta, this

ENERGY RESOURCES CONSERVATION BOARD

G. J. DeSorcy
Board Member

APPENDIX VII

FORM OF APPROVAL

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of an Approval to Calgary Power Ltd. authorizing the discontinued operation and salvaging of a transmission line in the Edmonton Area

APPROVAL NO.

WHEREAS Calgary Power Ltd., by application dated July 5, 1974, applied to the Energy Resources Conservation Board, for approval to remove from service and salvage a transmission line in the Edmonton area.

THEREFORE, the Energy Resources Conservation Board, pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, hereby orders as follows:

1. Approval is hereby granted to Calgary Power Ltd. to

   (a) discontinue operation of a transmission line designated as "Jasper Place Substation CP 272S" (hereinafter called "the Substation"), located in the South-east quarter of Section 28, Township 52, Range 25, West of the 4th Meridian, and

   (b) dismantle and salvage the works and installations associated with the substation.

2. Calgary Power shall notify the Board within 30 days of the time that the operation of Jasper Place Substation CP 272S has been discontinued.

3. The Board may,

   (a) upon its own motion, or

(b) upon the application of an interested person, rescind or amend this Approval at any time.

MADE at the City of Calgary, in the Province of Alberta, this

ENERGY RESOURCES CONSERVATION BOARD

G. J. DeSorcy
Board Member

ENERGY RESOURCES CONSERVATION BOARD

Decision 75-8
Application No. 8238

CROWSNEST PASS - TENT MOUNTAIN TRANSMISSION LINE

1 INTRODUCTION

1.1 The Application and Hearing

Calgary Power Ltd. applied under sections 9, 11, 13, and 17 of The Hydro and Electric Energy Act for approval to construct and operate a 25-kV[1] transmission line in the Crowsnest Pass - Tent Mountain Area. The transmission line would serve Coleman Collieries Ltd.'s Tent Mountain mine.

A public hearing was held in Blairmore on April 3, 1975, to consider this application with V. Millard, Dr. N. Berkowitz, and G.J. DeSorcy, P.Eng., sitting.

1.2 Appearances

The following table lists those parties appearing at the hearing.

Table of Participants

NOTE: Abbreviations shown in parentheses are used in this report.

Name	Represented by	Witnesses
Calgary Power Ltd. (Calgary Power)	D.O. Sabey, Q.C.	C.R. Hoar, P.Eng. S. Winning, P.Eng. W.R. Trotter B.A. Deisinger, P.Eng.

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[1] kV is the symbol used in this report for kilovolts (thousands of volts).

Great Divide Trail Task Force
Calgary Field Naturalists' Society
The Alpine Club of Canada
Alberta Wilderness Association
Alberta Fish and Game Association
Rocky Mountain Ramblers Association
Canadian Youth Hostels Association
Chinook Trail Association
Palliser Club
Sierra Club of Alberta
Skyline Trail Hikers of the Canadian Rockies
(Trail Groups) ....

C. Heine

Coleman Collieries Ltd. (Coleman Collieries) ....

F.H. MacLeod

Oldman River Planning Commission (ORPC) ....

W.P. McIntyre

Alberta Department of the Environment (Alberta Environment) ....

W.R. Galatiuk

Alberta Department of Energy and Natural Resources,
formerly known as the Department of Lands and Forests
(Alberta Energy and Natural Resources) ....

W.R. Galatiuk

Energy Resources Conservation Board Staff (Board staff) ....

A.L. McLarty
K.I. Montgomery, P.Eng.
W.L. McVeigh

As well, the interveners listed below made written submissions but did not appear at the hearing.

Name

Project: Great Divide Trails
Ms. Mary Jane Cox

Wilderness Parks & Natural Areas Committee
Federation of Alberta Naturalists
Mr. Michael D. McIvor, Chairman

Mr. Jeffrey Gruttz

Town of Coleman
Mr. John Kapalka, Secretary-Treasurer

The submissions of Ms. Cox, Mr. McIvor, and Mr. Gruttz were similar to those of the Trail Groups represented by Mr. Heine. The Town of Coleman suggested two alternative routes, but indicated no objections to the proposed one.

1.3 Background

There are several existing transmission lines in this area. Calgary Power has a 6.9-kV line running from Sentinel to the village of Crowsnest (see Figure 1). This line is supplied by Calgary Power's Coleman Substation, CP 799S, via a 25-kV line, CP 175L. In addition Calgary Power has, but does not operate, two 69-kV lines near Sentinel. A 138-kV Calgary Power line, CP 86L, is located on the north side of the Crowsnest Pass area, and provides a tie with British Columbia Hydro, which owns two 69-kV transmission lines supplying a gas compressor station west of the village of Crowsnest. No transmission line presently supplies Coleman Collieries' Tent Mountain mine.

A hiking trail, designated the Great Divide Trail, may cross the Crowsnest Pass in this area (see Figure 1), and interested groups have expressed concern regarding the possible locating of the proposed transmission line adjacent to the proposed route of the trail.

The Crowsnest Pass Highway Impact Study Group is considering the relocation of Highway No. 3, particularly in the area south of Crowsnest Lake. One of the Study Group's intentions is to improve the scenic view from the highway.

The application was advertised for objections and, because a number were received, the Board decided to hold a public hearing on April 3, 1975.

1.4 The Application

Calgary Power applied for a permit to construct and a licence to operate an electric transmission line, designated CP 175L, from Sentinel to Coleman Collieries' Tent Mountain mine, and a 25/4.16-kV substation at the mine (see Figure 1). The section from D to B would be of 25-kV construction, and from B to A of 138-kV construction; however the entire line would be operated at 25 kV. Section C-to-A was suggested as an alternative to section B-to-A. Calgary Power also applied to salvage portions of existing 6.9-kV and 69-kV transmission lines and to make the changes necessary to supply from the proposed transmission line those customers presently served from the 6.9-kV circuit.

2 DEFINITION OF ISSUES

The Board considers that the issues to be resolved are:

1. the need for the transmission line; and

2. the location of the transmission line.

3 THE NEED FOR THE TRANSMISSION LINE

3.1 Views of the Applicant

The applicant, Calgary Power, gave two main reasons for proposing the 25-kV transmission line. The first was the increased electric energy requirement at Coleman Collieries' Tent Mountain mine. In June 1975, the addition of electric shovels and other equipment will raise the peak-load requirement to between 2 and 3 MW[2]. The applicant wished to serve this load and has proposed the 25-kV line to do so.

The second reason was the need to repair the existing 6.9-kV line from Sentinel to the village of Crowsnest, and the opportunity of doing this repair through the rebuilding for 25 kV. The need for repair resulted from the line's poor physical condition rather than from growth in the electrical loads served by the line.

The applicant proposed to build the portion of the line from the Crowsnest Pass proper to the Tent Mountain mine to a capacity of 138 kV, and gave several reasons for this type of construction. It said the topography was such that construction using longer conductor spans between pole structures was more economical; however, to provide reliable service given the longer spans, strong prevailing winds, and rather inaccessable location, double-pole rather than single-pole structures were required, the latter being the type used for 138-kV lines. The additional cost of insulation for 138 kV rather that 25 kV was not great. The applicant further stated that the 25-kV line could carry only 8 MW, while Coleman Collieries had indicated the possibility of a 15-MW load in future, and therefore had agreed to pay, now, the increased cost associated with constructing for 138 kV rather than 25 kV.

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[2] MW is the symbol used in this report for megawatts (millions of watts).

3.2 Views of the Interveners

Mr. F.H. MacLeod, representing Coleman Collieries, was the only intervener to comment on the need for the line. Coleman Collieries' written submission stated that electric shovels developing a total of 3,000 h.p. were on order and expected to be ready for operation in June 1975; Coleman Collieries therefore desired electrical service to the Tent Mountain mine by that date. Mr. MacLeod said there were no firm projections of future load increases above 3 MW.

Also in its written submission Coleman Collieries noted that, together with its directly-associated operations, it employed about 640 people, over 95 per cent of whom lived in the Crowsnest Pass area, and that its operations generated over 50 per cent of all prime income in the area.

3.3 Views of the Board

The Board believes there is a need to construct the 25-kV transmission line to supply the mine's electrical load. Also the Board agrees with the applicant's desire to upgrade the reliability of service to those customers presently served by the 6.9-kV line.

The applicant's statements indicate a reasonable possibility that the mine's electrical load will increase to such an extent that a higher line-operating voltage will be required. Therefore, the Board believes that economic and environmental benefits would result from building the proposed 138-kV portion now rather than later.

4 THE LOCATION OF THE TRANSMISSION LINE

For the purpose of discussion, the line is divided into two sections as follows:

(a) the section of 25-kV construction from the eastern end of the line, north of Sentinel, to the beginning of the 138-kV construction (this is the portion in the Crowsnest Pass proper); and

(b) the section of 138-kV construction from the Crowsnest Pass proper to the Tent Mountain mine.

As shown on Figure 1, section (a) is from D to either C or B, and section (b) is from either C or B to A.

4.1 The Location of the Transmission Line in the Crowsnest Pass

4.11 Views of the Applicant

The applicant agreed that the transmission line's interference with the scenic view from Highway No. 3 should be minimized. It said, however, that it did not believe the line should be located other than on the existing 6.9-kV transmission line right of way until the final location of Highway No. 3 was determined. Therefore the applicant opposed the alternative route at the south-east end of Crowsnest Lake suggested by a Mr. Hladky, and proposed to use, for the present, the existing lake crossing and the poles at the south-west end of Crowsnest Lake where Highway No. 3 was adjacent to the lake.

The applicant said that when the highway is rebuilt on the east and south sides of Crowsnest Lake, it would consider the relocation of the line at the lake's east end and would, if possible, hang the conductors on the cliff face on the south side of Highway No. 3 at the south-west end of the lake.

The applicant noted that if the alternative route C-to-A was selected, the portion of the line from C to B would not be rebuilt but would be repaired and operated at 25 kV.

4.12 Views of the Interveners

The ORPC recommended that, on the south side of Crowsnest Lake, the transmission line be located on the south side of Highway No. 3 so as not to interfere with the scenic view from the highway northwards across the lake. To accomplish this at the south-west end of the lake, the ORPC suggested that the line be hung on the cliff face on the south side of the highway. It felt it reasonable to defer relocating the transmission line until after relocation of Highway No. 3.

In a written submission, Mr. John Hladky of Alberta Energy and Natural Resources suggested the alternative route shown on Figure 1 at the south-east end of Crowsnest Lake, on the basis that the relocation of Highway No. 3 would be along this route. He said removal of the lake crossing would be of benefit from an environmental standpoint.

4.13 Views of the Board

The Board agrees with the applicant's preferred route within the Crowsnest Pass proper, and believes that any modifications to the route on the south side of Crowsnest Lake should await the final decision regarding the relocation of Highway No. 3. These potential modifications to the transmission line route would require the approval of the Board at that time.

The Board notes that the line from Sentinel to the village of Crowsnest will be energized at 25 kV whether the preferred or alternative route from the Crowsnest Pass to the Tent Mountain mine is chosen.

4.2 Location of the Transmission Line from Crowsnest Pass to the Tent Mountain Mine

4.21 Views of the Applicant

The applicant indicated two possible routes from the Crowsnest Pass proper to the Tent Mountain mine. The applicant's preferred route was south from the village of Crowsnest adjacent to Island Creek (from B to A on Figure 1). The alternative route was adjacent to Crowsnest Creek (from C to A on Figure 1).

The applicant stated that if the preferred route was followed, an additional 1.39 miles of existing right of way (C-to-B) would be used and the portion C-to-B would be rebuilt rather than simply repaired as would occur if the alternative route were selected. The rebuilding of C-to-B would increase, somewhat, the reliability of the electrical service to the village of Crowsnest. The applicant estimated that the cost of rebuilding the section C-to-B would be $38,900, but did not estimate the cost of repairing this section.

Regarding the portions of the line constructed for 138 kV, the applicant stated that the alternative route would be more difficult and expensive to construct and maintain because Alberta Energy and Natural Resources have prohibited the building of the line between Crowsnest Creek and the mine's haul road, therefore the transmission line would have to be built high on the slope of the ridge, west of Crowsnest Creek. The applicant's cost estimates were $155,700 for the route C-to-A and $151,300 for the route B-to-A. The cost estimate for the latter included $112,000 for the 138-kV section, B-to-A, and $38,900 for rebuilding the 25-kV section, C-to-B.

Regarding access to the transmission line routes for construction and maintenance, the applicant stated that the mine's haul road would provide good all-weather access to the vicinity of the alternative route. Gaining access to the preferred route would be more difficult, particularly in winter, because the only road in the area was a logging road that is not generally open in winter. The applicant said that visual inspection of the alternative route would be easier because of the mine's haul road and because the line would be high on the slope. In response to questioning the applicant said that, because of the location of the pole structures and the access roads to them, erosion would be a greater problem if the alternative route was selected.

In response to the interventions of the groups concerned with the Great Divide Trail, the applicant siad that, for a distance of about a mile where trees have been blown down, a line on the preferred route would be visible from the proposed route for the Great Divide Trail. Otherwise, the line would be hidden from the trail and would be located a minimum of a couple of hundred yards from it.

In spite of its preference for the route B-to-A, the applicant said it was not strongly opposed to the alternative route.

It suggested three routes for the potential 138-kV connection to transmission line CP 86L. Connection points E and F were suggested should the preferred route be selected, and point G should the alternative route be selected (see Figure 1). Several difficulties would weigh against construction of a 138-kV transmission line to point E: the nearness of the route to an airstrip at the gas compressor station, the necessity of crossing the 69-kV lines supplying the station, and the difficulty of gaining access to point E for switching operations. The applicant stated, however, that this line would be less visible from Highway No. 3 than a line to point F. A line to point F would be constructed on a portion of the old Highway No. 3, and would be at least partially hidden from the present highway. Considering all the above factors, the applicant said it would prefer a connection at point F should route B-to-A be selected, but at point G if route C-to-A were chosen.

The applicant proposed that at the base of the northern slope of Tent Mountain the line should jog to the east, proceed south up the slope and at the top turn west to the mine substation (see Figure 1). Other parties have suggested that the route should go straight up to the mine substation along the nose of the slope. The letter H on Figure 1 indicates the area where this alternative route would divert from the applicant's route; however the alternative route itself is not shown on the map. Replying to questioning by the ORPC, the applicant commented on its proposal not to construct the line straight up the nose of the slope to the Tent Mountain mine from H to A, but rather to jog to the east before proceeding up the slope. The applicant said this alignment would provide shelter from the strong prevailing westerly-southwesterly winds, reduce erosion problems associated with the access road, and ease the difficulties of crossing the mine's haul road.

4.22 Views of the Interveners

Mr. C. Heine, representing the Trail Groups, appeared at the hearing. The following points were mentioned by one or more of the Trail Groups:

a) the proposed route for the Great Divide Trail follows the logging road adjacent to Island Creek, and then turns to follow Ptolemy Creek south-east toward Andygood Pass (see Figure 1);

b) the village of Crowsnest, with a general store and large parking lot, provides a good starting point for hikers travelling south and a convenient re-supply point for hikers travelling through the Crowsnest Pass on the trail;

c) the caves in Andygood Pass are a major attraction to hikers; and

d) the Island Creek route is the most unspoiled route available south from Crowsnest Pass, and, hopefully, the establishment of the trail would serve to inhibit further development near the creek.

For these reasons the Trail Groups suggested that the alternative route C-to-A be selected.

Mr. W.P. McIntyre of the ORPC questioned the alignment of the line up the slope of Tent Mountain from H to A and suggested that if the line were built on the nose of the slope, conservation and reclamation problems would be eased. The ORPC said in its written submission that it favoured the applicant's preferred route, B-to-A, recommending that the line be kept to the west of Island Creek so as to be unobtrusive to hikers on the Great Divide Trail. Regarding the potential 138-kV connection to CP 86L, the ORPC stated that it preferred the line to point E, and recommended that the applicant begin studying this possible connection now so that adequate consideration could be given to each route.

4.23 Concerns of the Department of the Environment and the Department of Energy and Natural Resources

Mr. W.R. Galatiuk asked several questions regarding access roads for the construction and maintenance of the proposed transmission line. His concerns were the number of permanent roads that would be built, the possibilities of revegetating temporary roads, and the amount of erosion that would result from both the temporary and permanent roads. His questioning suggested that because the alternative route was high on the slope of the ridge west of Crowsnest Creek the potential for erosion was much greater there than on the preferred route.

4.24 Views of the Board

The Board agrees with the applicant that there is little to choose between the applicant's preferred route B-to-H and alternative route C-to-H. As the Board sees it, the preferred route would be less costly to construct but would be somewhat more expensive and difficult to inspect and maintain, particularly during the winter months when the logging road may be closed. The alternative route would be adjacent to the existing mine haul road and consequently would provide somewhat more reliable service in that it would be easier to inspect, and over much of the route would be easier to maintain. The preferred route has the disadvantage of being located near the planned Great Divide Trail and was strongly opposed by the Trail Groups. The Board agrees with the applicant that the alternative route up the nose of the slope from H to A would expose the line to the strong prevailing winds of the area, and thus reduce the reliability of the supply to the mine. Therefore the Board believes the section of the line from H to A should be on the applicant's preferred route.

The alternative route from C to H and the applicant's preferred route from H to A would create greater erosional problems during construction and were opposed by the ORPC at the hearing. Subsequent to the hearing the Board was advised by Alberta Environment and Alberta Energy and Natural Resources of their concerns regarding the alternative route from C to H and the applicant's preferred route from H to A, especially respecting erosional problems along access roads. The Board recognizes that these routes present greater erosional problems but notes that the applicant is familiar with the routes and expressed no great reservations about its ability to construct the line in a satisfactory manner. Therefore the Board believes that the erosional problems could be minimized by the judicious location of line structures and appropriate construction procedures. Having regard for the limited number of structures in the sensitive steep-slope area, the Board believes that, with special construction procedures, the overall erosional impact would not be significant.

With respect to the possible future connection of the proposed line to the 138-kV line, 86L, the Board believes that the preferred route has only a modest advantage. Such a connection would be considered if and when an application is received by the Board; however the applicant should begin to study the routes well before the connection is needed.

On balance, the Board believes that the alternative route C-to-H together with the applicant's preferred route H-to-A would provide somewhat more reliable service and that environmental disadvantages regarding possible erosional effects from a carefully constructed line are more or less offset by the visual impact of the preferred route on the planned Great Divide Trail. The Board emphasizes that special consideration should be given to the location of structures and the construction procedures.

5 MINISTERIAL APPROVAL

The Hydro and Electric Energy Act, section 10, subsection (1), provides that the Board shall refer an application for a permit to the Ministers of the Environment and of Lands and Forests for their approval of the application as it affects matters of the environment.

The Board, in compliance with the above, has referred the subject applications to the Ministers of the Environment and of Lands and Forests accordingly. Their respective approvals, if given, would be incorporated as Appendices A and B to the Board's proposed Permit and Licence Nos. CP 75-14 and CP 75-15, illustrated in Appendices I and II attached. Also, the Board would make its permits subject to any conditions imposed by the Ministers of the Environment and of Lands and Forests in their approvals.

6 DECISION

Having regard for its responsibilities under The Hydro and Electric Energy Act and, subject to the approval of the Ministers of the Environment and of Lands and Forests with respect to matters affecting the environment, the Board is prepared to issue permits and licences for the construction and operation of the 25-kV transmission line and 25/4.16-kV

Tent Mountain mine substation, and to issue approvals for the salvaging of portions of CP 505L, CP 506L, and the existing 6.9-kV distribution line.

The permits and licences, and the approvals, would be in the form set out in Appendix I, II, III, and subject to the terms and conditions contained therein.

N. Berkowitz
Board Member

MAY 6, 1975

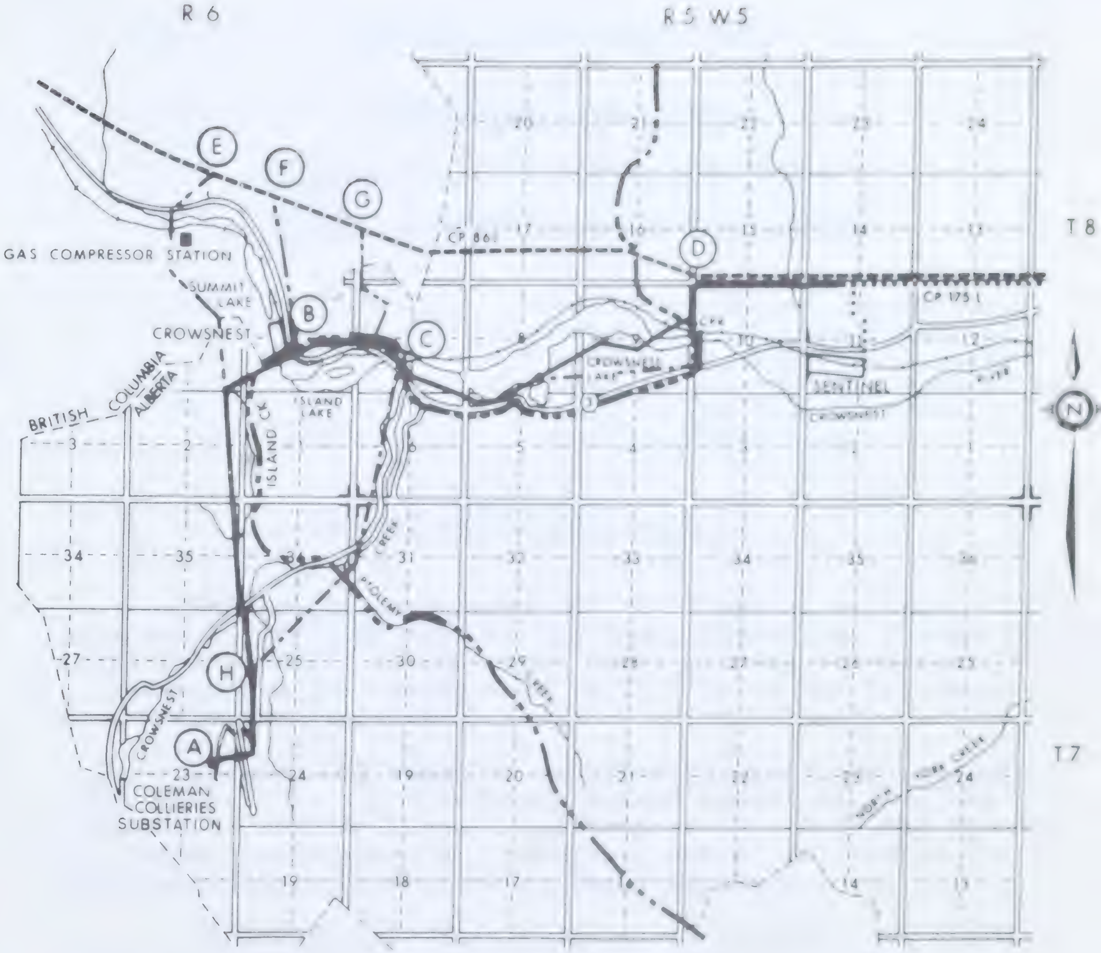


FIGURE 1 PROPOSED CALGARY POWER LTD 25-kV TRANSMISSION LINE

——— PROPOSED ROUTE OF CALGARY POWER LTD 25-kV TRANSMISSION LINE
— — — · — ALTERNATIVE ROUTE OF CALGARY POWER LTD 25-kV TRANSMISSION LINE
— — — — EXISTING CALGARY POWER LTD 138-kV TRANSMISSION LINE
·········· OTHER EXISTING CALGARY POWER LTD TRANSMISSION LINES
—— — — —— POSSIBLE FUTURE 138-kV CONNECTING LINES
— · · · — PROPOSED GREAT DIVIDE TRAIL ROUTE

APPENDIX I

FORM OF PERMIT AND LICENCE

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of a Permit and Licence to Calgary Power Ltd. authorizing the construction and operation of a transmission line in the Crowsnest Pass - Tent Mountain area

PERMIT AND LICENCE NO.

WHEREAS Calgary Power Ltd. by application dated December 6, 1974, applied to the Energy Resources Conservation Board for a Permit to construct and a Licence to operate a transmission line designated as CP 175L in the Crowsnest Pass - Tent Mountain area; and

WHEREAS the Board is prepared to grant the application, subject to the conditions herein contained, and the Minister of the Environment and Minister of Lands and Forests have given their approval, hereto attached, insofar as the application affects matters of the environment.

THEREFORE, the Energy Resources Conservation Board, pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, hereby grants to Calgary Power Ltd. (hereinafter called "the Operator") a PERMIT to construct and a LICENCE to operate transmission line CP 175L subject to the provisions of the Act and regulations and orders pursuant thereto and to the following terms and conditions:

1. The route of the transmission line designated as CP 175L shall be as shown on Appendix A to this Permit and Licence.

2. Specifications of transmission line CP 175L shall be and include as follows:

(a) all structures to be of wood pole construction,

(b) the portion of the transmission line, between the South-west quarter of Section 7, Township 8, Range 5, West of the 5th Meridian and the Tent Mountain Mine Substation in the North-east quarter of Section 23, Township 7, Range 6, West of the 5th Meridian, to be designed and built for 138-kV operation,

(c) the remaining portion of the line to be designed and built for 25-kV operation,

(d) the line to be operated at a nominal 25-kV,

and as more particularly described in an application to the Board from the Operator, dated December 6, 1974.

3. The Operator shall satisfy the Board within 30 days of the completion of the construction of the transmission line that such construction has been in accordance with the provisions of this Permit and Licence and The Electrical Protection Act and regulations and orders pursuant to that Act.

4. The Operator shall, within 30 days of the time that the transmission line is first energized, notify the Board that the transmission line has been energized and is operating within a specified voltage range.

5. Insofar as it pertains to matters of the environment, this Permit and Licence is subject to the approval of the Minister of the Environment, hereto attached as Appendix B, and to the terms and conditions therein contained.

6. Insofar as it pertains to matters of the environment, this Permit and Licence is subject to the approval of the Minister of Lands and Forests, hereto attached as Appendix C, and to the terms and conditions therein contained.

7. (1) Subject to subclause (2), the Operator shall satisfy the Board within one year of the date hereof that construction of the transmission line as permitted herein has been completed.

(2) On its own motion or upon the application of an interested party, the Board may stipulate such later date for completing construction of the transmission line as it considers suitable under the circumstances.

8. The Board may

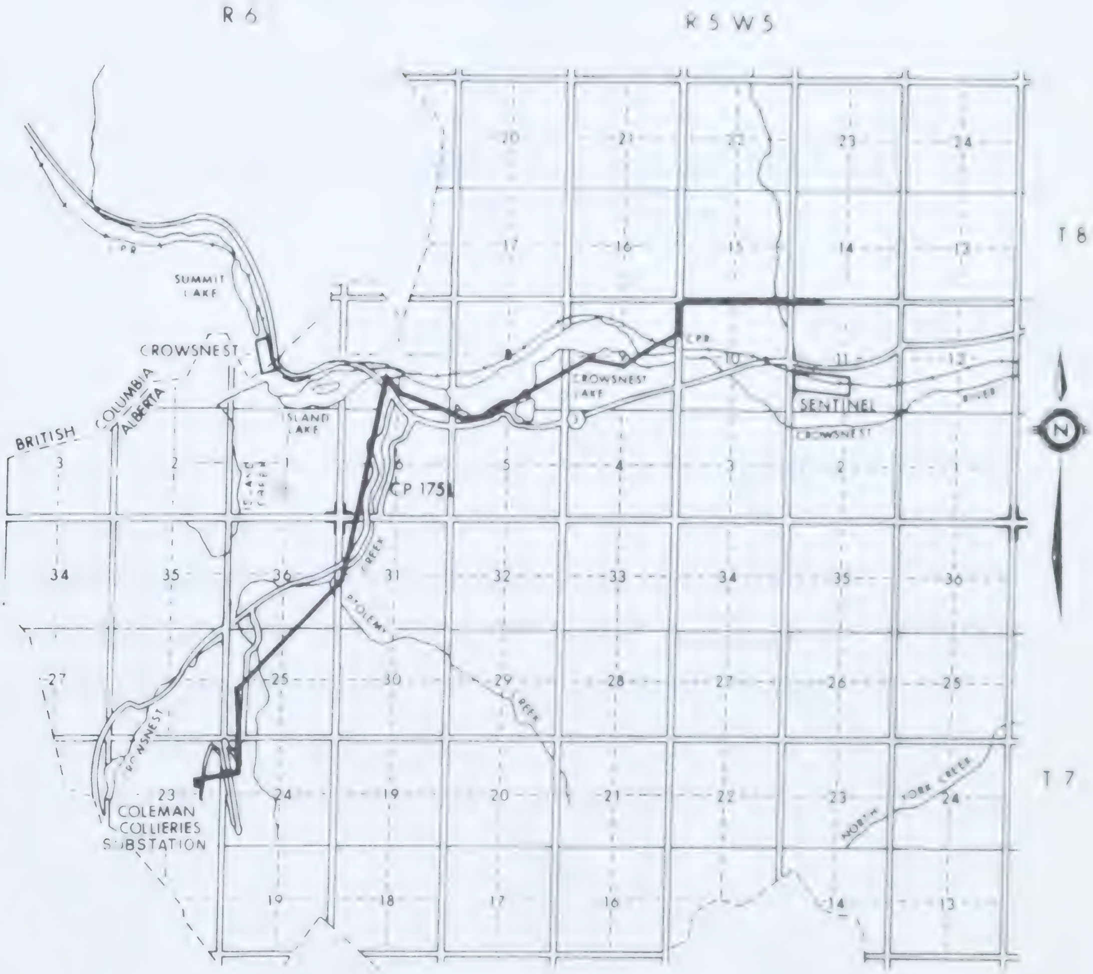
(a) cancel or suspend this Permit and Licence, in whole or in part, for failure of the Operator to comply with any provision of the Act, the regulations, or the terms and conditions set out herein, or

(b) amend this Permit and Licence as it deems suitable in the circumstances.

MADE at the City of Calgary, in the Province of Alberta, this

ENERGY RESOURCES CONSERVATION BOARD

G. J. DeSorcy
Board Member



CALGARY POWER LTD. 25-kV. TRANSMISSION LINE

APPENDIX A TO PERMIT AND LICENCE

APPENDIX B TO PERMIT AND LICENCE NO. ____

Department of the Environment

MINISTERIAL APPROVAL

No. ERCB

Edmonton, Alberta
1975

Pursuant to section 10 of The Hydro and Electric Energy Act, I, D. J. Russell, Minister of the Environment, hereby approve Application No. 8238, dated December 6, 1974, from Calgary Power Ltd. to the Energy Resources Conservation Board in the matter of a 25-kV transmission line, CP 175L, from Sentinel to the Tent Mountain Mine Substation, insofar as it affects matters of the environment.

MINISTER OF THE ENVIRONMENT

APPENDIX C TO PERMIT AND LICENCE NO. ____

Department of Lands and Forests

MINISTERIAL APPROVAL

No. ERCB

Edmonton, Alberta
1975

Pursuant to section 10 of The Hydro and Electric Energy Act, I, D. R. Getty, Acting Minister of Lands and Forests, hereby approve Application No. 8238, dated December 6, 1974, from Calgary Power Ltd. to the Energy Resources Conservation Board in the matter of a 25-kV transmission line, CP 175L, from Sentinel to the Tent Mountain Mine Substation, insofar as it affects matters of the environment.

ACTING MINISTER OF LANDS AND FOREST

APPENDIX II

FORM OF PERMIT AND LICENCE

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of a Permit and
Licence to Calgary Power Ltd.
authorizing the construction
and operation of a transmission
line in the Crowsnest Pass -
Tent Mountain area

PERMIT AND LICENCE NO. ______

WHEREAS Calgary Power Ltd. by application dated December 6, 1974, applied to the Energy Resources Conservation Board for a Permit to construct and a Licence to operate a transmission line designated as Tent Mountain Mine Substation (hereinafter called "the Substation") in the Crowsnest Pass - Tent Mountain area; and

WHEREAS the Board is prepared to grant the application, subject to the conditions herein contained, and the Minister of the Environment and Minister of Lands and Forests have given their approval, hereto attached, insofar as the application affects matters of the environment.

THEREFORE, the Energy Resources Conservation Board, pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, hereby grants to Calgary Power Ltd. (hereinafter called "the Operator") a PERMIT to construct and a LICENCE to operate Tent Mountain Mine Substation subject to the provisions of the Act and regulations and orders pursuant thereto and to the following terms and conditions:

1. The substation shall be wholly located in the Northeast quarter of Section 23, Township 7, Range 6, West of the 5th Meridian.

2. Specifications of the Substation shall be and include as follows:

(a) one 25/4.16-kV transformer fused on the primary side,

(b) a steel link fence enclosing the substation,

(c) associated substation equipment,

and as more particularly described in an application to the Board from the Operator, dated December 6, 1974.

3. The Operator shall satisfy the Board within 30 days of the completion of the construction of the Substation that such construction has been in accordance with the provisions of this Permit and Licence and The Electrical Protection Act and regulations and orders pursuant to that Act.

4. The Operator shall, within 30 days of the time that the Substation is first energized, notify the Board that the Substation has been energized and is operating within a specified voltage range.

5. Insofar as it pertains to matters of the environment, this Permit and Licence is subject to the approval of the Minister of the Environment, hereto attached as Appendix A, and to the terms and conditions therein contained.

6. Insofar as it pertains to matters of the environment, this Permit and Licence is subject to the approval of the Minister of Lands and Forests, hereto attached as Appendix B, and to the terms and conditions therein contained.

7. (1) Subject to subclause (2), the Operator shall satisfy the Board within one year of the date hereof that construction of the Substation as permitted herein has been completed.

(2) On its own motion or upon the application of an interested party, the Board may stipulate such later date for completing construction of the substation as it considers suitable under the circumstances.

8. The Board may

(a) cancel or suspend this Permit and Licence, in whole or in part, for failure of the Operator to comply with any provision of the Act, the regulations, or the terms and conditions set out herein, or

(b) amend this Permit and Licence as it deems suitable in the circumstances.

MADE at the City of Calgary, in the Province of Alberta, this

ENERGY RESOURCES CONSERVATION BOARD

G. J. DeSorcy
Board Member

APPENDIX A TO PERMIT AND LICENCE NO. ____

Department of the Environment

MINISTERIAL APPROVAL

No. ERCB

Edmonton, Alberta
1975

Pursuant to section 10 of The Hydro and Electric Energy Act, I, D. J. Russell, Minister of the Environment, hereby approve Application No. 8238, dated December 6, 1974, from Calgary Power Ltd. to the Energy Resources Conservation Board in the matter of the Tent Mountain Mine Substation, insofar as it affects matters of the environment.

MINISTER OF THE ENVIRONMENT

APPENDIX B TO PERMIT AND LICENCE NO. ____

Department of Lands and Forests

MINISTERIAL APPROVAL

No.   ERCB

Edmonton, Alberta
1975

Pursuant to section 10 of The Hydro and Electric Energy Act, I, D. R. Getty, Acting Minister of Lands and Forests, hereby approve Application No. 8238, dated December 6, 1974, from Calgary Power Ltd. to the Energy Resources Conservation Board in the matter of the Tent Mountain Mine Substation, insofar as it affects matters of the environment.

ACTING MINISTER OF LANDS AND FORESTS

APPENDIX III

FORM OF APPROVAL

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of an Approval to Calgary Power Ltd. authorizing a transmission line in the Sentinel area.

APPROVAL NO. HE

WHEREAS Calgary Power Ltd., by application dated December 6, 1974, applied to the Energy Resources Conservation Board for approval to discontinue operation of and salvage transmission lines in the Sentinel area.

THEREFORE, the Energy Resources Conservation Board pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, hereby orders as follows:

1. Approval is hereby granted to Calgary Power Ltd. to:

    (a) discontinue operation of that portion of a transmission line, operated at a nominal voltage level of 6.9 kV, extending from the eastern boundary of Section 9, Township 8, Range 5, West of the 5th Meridian to the South-west quarter of Section 12, Township 8, Range 6, West of the 5th Meridian; and

    (b) salvage the portion of the 6.9-kV transmission line from the eastern boundary of Section 9, Township 8, Range 5, West of the 5th Meridian to the South-west quarter of Section 7, Township 8, Range 5, West of the 5th Meridian; and

    (c) rebuild for 25 kV the portion of the 6.9-kV transmission line extending from the South-west quarter of Section 7, Township 8, Range 5, West of the 5th Meridian to the South-west quarter of Section 12, Township 8, Range 6, West of the 5th Meridian; and

(d) operate at 25 kV the portion of the line cited in subclause (c); and

(e) salvage those portions of 69-kV transmission lines CP 505L and CP 506L located on the Southern boundaries of Sections 14 and 15, Township 8, Range 5, West of the 5th Meridian.

2. Calgary Power Ltd. shall notify the Board within 30 days of the time that:

(a) the operation of the transmission line has been discontinued at a nominal voltage level of 6.9 kV; and

(b) the portion of the line cited in Clause 1, subclause (c) has been energized at 25 kV.

3. The Board may,

(a) upon its own motion, or

(b) upon the application of an interested person,

rescind this Approval at any time.

MADE at the City of Calgary, in the Province of Alberta, this

ENERGY RESOURCES CONSERVATION BOARD

G. J. DeSorcy
Board Member

ENERGY RESOURCES CONSERVATION BOARD

Decision 75-9
Application No. 7954

GAS PROCESSING PLANT
ROSEVEAR FIELD

1 INTRODUCTION

In response to Energy Resources Conservation Board Decision 75-2 issued on February 7, 1975, Sun Oil Company Limited submitted an evaluation of four alternate sites in the general Rosevear area in which a gas processing plant of the type described in the subject application might be located. Copies of this evaluation were supplied to all interveners who filed briefs with the Board and responses to it were received from Mrs. B. Johnston, Mr. J. Campbell, Mr. R. Twiss, Mrs. K. Twiss and the Department of the Environment.

The location of the proposed site, the alternate sites and wells drilled in the area are shown in the attached Figure 1A.

2 SUBMISSION OF SUN

In its submission Sun compared the proposed site in Section 33, Township 54, Range 15, West of the 5th Meridian with four alternate locations, two of which lie north of the McLeod River and two south of the river.

Sun indicated that the two alternate sites north of the river, (Sites C and D on Figure 1A) which would still be in the vicinity of Bear Lake, were unsuitable because of the lower elevations, proximity to the McLeod River, and lack of non-agricultural land for a plant site. In addition Sun observed that these alternate sites are further from proven and potential gas production and would therefore incur higher service and operating costs.

Sun acknowledged that the two sites south of the McLeod River, (Sites A and B on Figure 1A) would have some advantage over the original proposed site in that sulphur could be shipped by rail. This would reduce the truck traffic volume as well as shipping costs. Moreover, one of the sites is near a potential gas well which, if future deliverability were needed, could be tied into the plant. Both the alternate plant sites south of the river are at the same elevation as the original site. Sun stated however that these advantages were outweighed by disadvantages accruing from the need for

(a) crossing the McLeod River with sour and sweet gas pipe lines,

(b) additional compression,

(c) flare facilities at the wellheads north of the river,

(d) line heaters, and

(e) longer access roads between wells and plant which increase safety hazards.

As well, present load limits on the roads would not permit trucking of products from the plant.

In general, Sun contended that siting the plant at any of the alternate locations would increase capital and operating costs because of longer pipe lines and additional equipment requirements. The incremental capital costs were estimated to be

Site A	$1,019,968
Site B	1,081,187
Site C	530,964
Site D	608,009

Sun calculated that savings from transporting sulphur by rail rather than truck would payout the cost of relocating to Site A in 12 years assuming no income taxes were paid on the savings.

The environmental impact of more than one plant was assessed by Sun through a study of a hypothetical situation in which its proposed plant was twinned with a second of similar size at Site A. Calculations showed that even when wind conditions would cause overlapping of the plumes from the two incinerator stacks, the maximum calculated sulphur dioxide concentration would only be 0.173 parts per million which is less than the 0.2 parts per million standard. If a single plant twice the size of the proposed plant were built on Site A, Sun indicated that the maximum sulphur dioxide concentration at Bear Lake would decrease from 0.09 to 0.07 parts per million. Sun concluded therefore that a single larger plant south of the river would not aid dispersion of gaseous pollutants.

Sun recognized the possibility of significant gas reserves being developed south of the McLeod River, but noted that current drilling and a recent Crown land sale indicate the possibility that significant gas reserves may also be developed north and west of the Rosevear Field. If such development occurred and it were decided to process all gas in the area in a common plant south of the river, that plant would not be central to gas north of the river and would also require environmentally undesirable additional river crossings. Sun pointed out that it is not desirable or practical to wait until all exploration is completed in an area before plans are made as to where a processing plant should be built. Sun expressed the opinion that the gas discoveries made in the general Rosevear area to date are in separate pools.

With respect to ecological concerns, Sun now plans to increase the minimum required sulphur recovery efficiency from the originally proposed 93 per cent to 94 per cent and to lower the maximum permitted sulphur dioxide emission rate from 12.3 long tons per day to 10.5 long tons per day. Sun would also provide additional diking on its property near the plant site to ensure that even under extreme conditions no liquid spills could escape from Sun property to the local streams and lakes, and design the plant to be quieter than current Board regulations require. Sun pointed out that the visual impact of the plant would be reduced by the trees surrounding the proposed plant site and that the only visible parts would be the tops of the towers and incinerator stack.

3 VIEWS OF THE INTERVENERS

The interveners restated their views that the original plant site selected by Sun would result in increased noise and odour levels, greater truck traffic and generally cause a deterioration of the environment in the vicinity of Bear Lake. Observing that gas is being discovered south of the McLeod River, the interveners feared that the proposed Sun gas plant might later be expanded or that several gas plants may be built in the area. In the interveners' opinion it would be desirable to have a single large plant at some distance from Bear Lake, preferably south of the McLeod River. The interveners also thought that the plant operations may create health or safety hazards for people in the area. Additional cost such as would be entailed in locating the proposed plant at an alternate site should not, in the interveners' opinion, be a deciding factor in the choice of a suitable plant site.

4 VIEWS OF THE DEPARTMENT

The Department stated that the site proposed by Sun in Section 33, Township 54, Range 15, West of the 5th Meridian, has been adequately designed to protect the environment. However, it expressed the view that the site would only be environmentally acceptable if there are no pipe line crossings of the McLeod River in connection with the proposed plant or any future plants. The Department also indicated that further evaluation of the noise levels should be made to determine the impact on people in the area.

5 VIEWS OF THE BOARD

The Board has reviewed the possible alternate sites using the criteria listed under Views of the Board in Decision 75-2. The Board finds that implicit in its consideration of the siting problem is the need for consideration of whether more than one plant may be permitted in the area. Accordingly, this matter is also dealt with under several of the criteria.

(a) Distance from existing plants, availability of utilities, soil conditions. The Board believes that all the sites are equal with respect to these criteria and that no one site offers any advantage over the others.

(b) Proximity to wells. In this review the Board has considered not only existing wells but the potential for future wells. Reference to Figure 1A indicates that if consideration is given only to the wells which Sun intends to connect to its system, the proposed plant site is appropriately located. However, having regard to presently completed and drilling wells, Site D or possibly even Site A appear to be more centrally located than the proposed site.

With respect to the need for more than one plant in the area, the criterion of proximity to wells would favour the concept of more than one plant.

(c) Highest accessible elevation. The Board notes that Sites A and B are at about the same elevation as the proposed site and would have the same height advantages. Sites C and D are somewhat disadvantaged by lying lower.

There does not appear to be a single site in the area with a significant elevation advantage over all others.

(d) Ecology of the terrain. The Board believes that this criterion should include a consideration of the impact on the environment of gaseous emissions, potential liquid releases, noise, and the pipe line system related to each site considered.

(i) The Board believes that the impact of gaseous emissions would be essentially the same for any of the investigated sites and that enforcement of ground level concentration standards for various pollutants would make it negligible. The existence of several plants in the area would undoubtedly increase the likelihood of accidental nuisance-type emissions, and on these grounds the concept of a single plant for the entire area would be favoured. Also favouring the concept of a single plant would be the Board's policy of requiring increased recovery efficiencies with increased rates of sulphur processing. On the other hand, with respect to normal emissions of sulphur dioxide, more than one plant, each designed to meet ground level standards for plume-overlap conditions, would tend to promote greater dispersion of emissions and probably reduce the possibility of a high concentration of noxious gases if a serious mishap occurred.

(ii) The adverse consequence of possible liquid releases to the surrounding watershed would be significantly greater for Sites C or D which are near the McLeod River and for Site B which is in a low muskeg type area and has several streams in the vicinity. The proposed site, with the additional diking planned by Sun, or Site A with similar extra precautions, should have essentially no adverse consequences due to liquid releases.

The existence of more than one plant in the area would increase the likelihood of liquid releases. Provided that each plant had adequate diking and took other appropriate precautions, the potential for releases to the surrounding watershed would become so slight that this criterion would not be a basis for limiting the processing facilities in the area to a single plant.

(iii) The impact of noise from the various plant sites is essentially a question of the number of people that would be within the noise range of the particular site. Investigation by the Board staff indicates that processing plant noise from the type of facility planned for Rosevear would be inaudible at distances of 1.5 miles or more. Since none of the investigated sites has a significant population centre within such a range and in any case since measures can be taken to reduce sound levels to less than would be expected from a typical installation, the Board considers that all five of the investigated sites would be acceptable and essentially equivalent from this viewpoint.

The impact of noise on the local residents would support the concept of one plant rather than several on grounds that, with only one plant, and a maximum permissible noise level independent of plant size, fewer people would likely be within earshot.

(iv) The adverse impact of pipe lines is related to their number and length. In terms of proximity to present and drilling wells, the proposed site, Site D on the northern side of the river, or Site A on the southern side of the river would be equally acceptable, while Sites B and C lead to more or longer lines. In the Rosevear area, the potential impact of pipe lines on the ecology would be increased if a number of lines were built across the river. The Board notes the Department of the Environment's position that river crossings must be minimized. This suggests that for the general Rosevear-Peers area more than one plant may be desirable. Also, since wells at a considerable distance from a processing plant, particularly if a river intervenes, would likely require wellhead compression and flaring facilities, there is support for the concept of more than one plant in the area.

(e) Adequate distance from densely populated areas. The Board considers that Site B would probably be the most suitable from this viewpoint because of its remoteness. Sites C and D have several farm residences in their vicinity but would nonetheless be reasonable. The proposed site and Site A would be the least acceptable due to the nearness of Bear Lake and the town of Peers, respectively. Respecting the impact of truck traffic on the public, Sites A and B would have the potential of moving some of the products by rail and thus reducing the total road traffic. These sites would thus have an advantage over the proposed site or Sites C or D. The traffic pattern would probably be essentially the same for the proposed site and Sites C or D. The Board notes that for the proposed site the traffic pattern would tend to be away from Bear Lake.

(f) Minimum use of productive agricultural lands. Sites A, C and D are located in farming areas and would remove more land from agricultural use than would the proposed site or Site B. This criterion tends to support the concept of only one plant in the area. However, if two or more acceptable sites exist on land not suitable for agricultural use, this would not be an important point.

(g) Developable at reasonable cost. Although the Board believes that cost should not be the deciding factor in selecting a plant site, it considers that it should be one of the factors taken into consideration. In this respect, the estimates made by Sun for the cost of relocating the plant site were reviewed by the Board and appear to be reasonable. The information suggests that the proposed site would have a capital cost advantage over the other sites ranging from about one-half to $1 million and that for Sites A and B south of the river these costs would be recovered over an extended period due to a reduced cost for sulphur movement. The Board has not determined whether one large plant for the area would be more attractive from an economic viewpoint than would two or more smaller plants but believes it would not in view of the modest rate of gas development in the area.

In appraising the overall siting problem the Board concludes that it must address itself to the question of whether only one plant is to be authorized and expanded as necessary, or in the alternative whether two or more plants may be permitted in the area. Even though the Board does not normally favour a multiplicity of small gas processing plants in a relatively small area, in this particular situation and to minimize river crossings by pipe lines, the Board believes that more than one plant may be warranted if gas reserves developed south of the river require processing. Given present and expected gas developments there seems little question that if more than one plant is to be built to serve the area the first of these should be north of the river.

All things considered the Board concludes that it is prepared to authorize a gas processing plant north of the river. Further, the proposed site of the applicant, when compared to other north bank sites, appears on balance to be best suited for a plant. Accordingly the Board is prepared to approve the site of Sun Oil in the North-west quarter of Section 33, Township 54, Range 15, West of the 5th Meridian.

6 MINISTERIAL APPROVAL

Section 38, subsection (3) of the Oil and Gas Conservation Act provides that

> 38. (3) The Minister of the Environment may give his approval with or without conditions, but where conditions are imposed, the Board shall, if it approves the scheme,

make its order subject to the same conditions imposed by the Minister of the Environment when he gave his approval.

The Board, in compliance with the above, referred the application to the Minister of the Environment for his approval of it as it affects matters of the environment.

The Board has incorporated in its approval any conditions affecting matters of the environment imposed by the Minister in his approval.

7 DECISION

The Board hereby grants the application by Sun to construct a gas processing plant in Section 33, Township 54, Range 15, West of the 5th Meridian in the Rosevear Field subject to the normal conditions imposed on a gas processing plant and to the following special conditions:

(a) the minimum required sulphur recovery efficiency be increased from 93 to 94 per cent.

(b) the maximum permitted sulphur dioxide emission rate be reduced a corresponding amount from 12.3 long tons per day to 10.5 long tons per day.

(c) within three months of commencement of processing operations at the plant, the operator shall undertake a suitable study to determine noise levels at Bear Lake under all conditions and report the findings to the Board. The Board may require that further steps be taken to reduce sound levels at the plant if the study indicates that such is necessary.

(d) any approval issued is subject to the terms and conditions that the Minister of the Environment may impose.

Board Approval No. 2125, a copy of which is attached, is issued concurrently with this decision.

ENERGY RESOURCES CONSERVATION BOARD

D R Craig

D. R. Craig
Vice Chairman

May 7, 1975

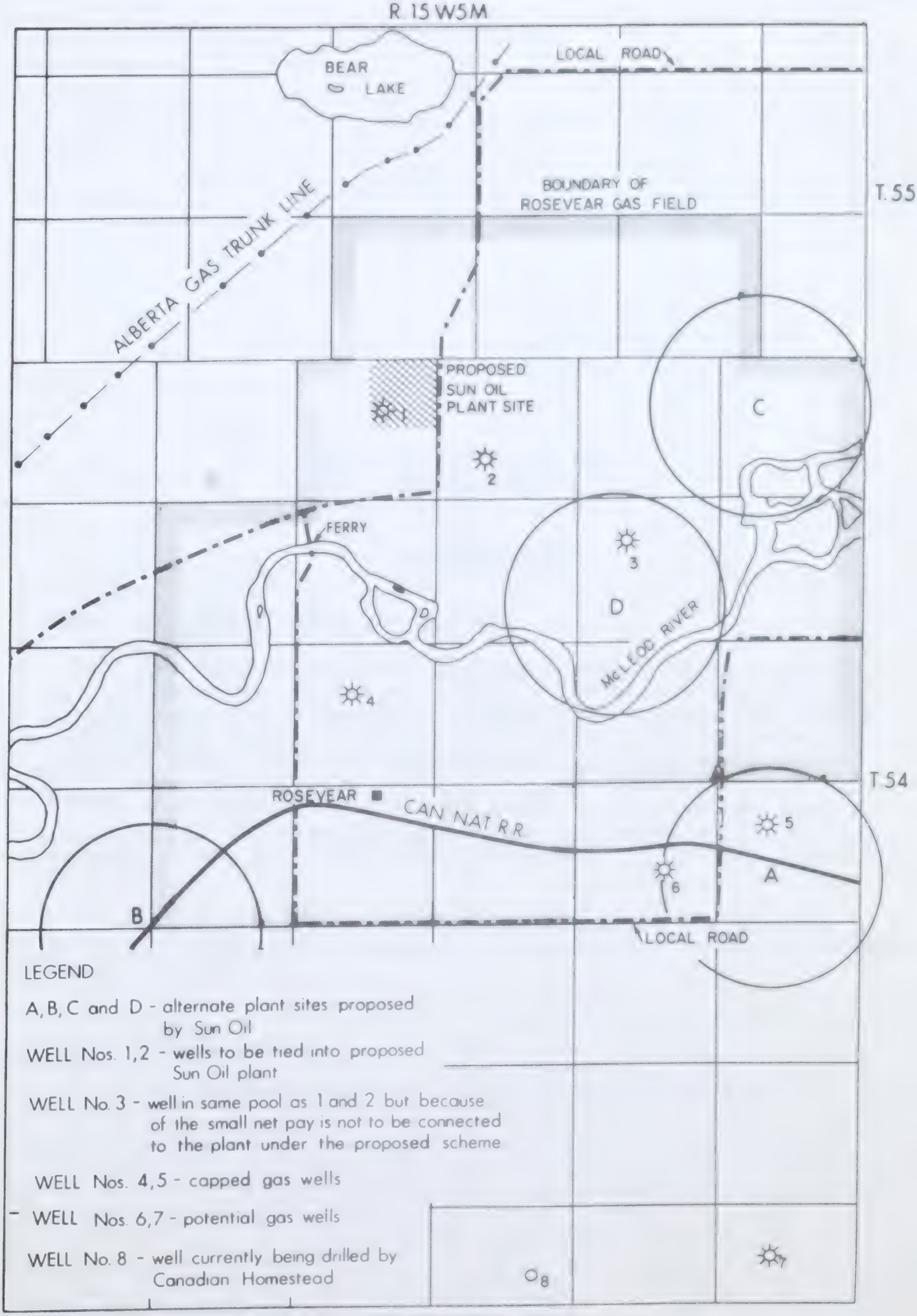

R. 15 W5M
BEAR LAKE
LOCAL ROAD
BOUNDARY OF ROSEVEAR GAS FIELD
T. 55
ALBERTA GAS TRUNK LINE
PROPOSED SUN OIL PLANT SITE
1
2
C
FERRY
3
D
McLEOD RIVER
4
T. 54
ROSEVEAR
CAN NAT R.R.
5
6
A
B
LOCAL ROAD
LEGEND
A, B, C and D - alternate plant sites proposed by Sun Oil
WELL Nos. 1,2 - wells to be tied into proposed Sun Oil plant
WELL No. 3 - well in same pool as 1 and 2 but because of the small net pay is not to be connected to the plant under the proposed scheme
WELL Nos. 4,5 - capped gas wells
WELL Nos. 6,7 - potential gas wells
WELL No. 8 - well currently being drilled by Canadian Homestead
8
7

FIGURE 1A TO DECISION 75-9

[illegible] [illegible] C1AR-1 OAR-1
O1AR-1 [illegible] [illegible] [illegible]
IL-1 [illegible] [illegible] [illegible] ILPL
[illegible] [illegible] [illegible] IDO3-1 IDPL
CA-1 DEC-2 Gen-2 O&A-1

ENERGY RESOURCES CONSERVATION BOARD

DECISION 75-10
APPLICATION NO. 8149
(EDMONTON POWER)

LAMBTON SUBSTATION AND 240-kV TRANSMISSION LINE

1. INTRODUCTION

1.1 The Application and Hearing

The City of Edmonton applied pursuant to section 9, 11, and 14 of The Hydro and Electric Energy Act for permits to construct and licences to operate a double-circuit 240-kV transmission line and substation to supply the southeast Edmonton area. The transmission line circuits would be designated 904L West and 904L North and the applied for 240/14.4-kV substation would be known as the Lambton substation. In addition, the applicant requested an order to connect the proposed transmission line to Calgary Power's line 904L.

The application was heard by the Board at Edmonton on 12 May 1975 with V. Millard, N. Berkowitz, and C. J. Goodman, P.Eng., sitting.

1.2 Appearances

The following parties appeared at the hearing:

TABLE OF PARTICIPANTS

Note: Abbreviations shown in parenthesis are used in this report.

	Represented by	Witnesses
The City of Edmonton (City; Edmonton Power)	H. F. Wilson	R. McClary, P.Eng. A. Sadesky, P.Eng. T. Loat J. Laux
Beckwith Farms (1966) Ltd. (Beckwith Farms)	L. A. Desrochers	D. L. Makale J. Whetzel P. Edwards
Capital Management Ltd. (Capital Management)		B. Hitchon G. Mulek
Mr. & Mrs. D. K. Ross	D. R. Thomas	
Calgary Power Ltd. (Calgary Power)		E. J. MacLeod R. E. Keyes
Energy Resources Conservation Board (Board; Board staff)	A. L. McLarty K. I. Montgomery, P.Eng. B. E. Olliver	

1.3 Background

Edmonton Power is a municipally owned utility that generates and distributes electric energy within Edmonton. As of 31 December 1974 it had a net installed capacity of 732 MW[1] and in 1974 generated about 2,875 GWh[2] of electric energy mainly using natural gas as fuel. Edmonton Power is normally interconnected with the Calgary Power system at the Clover Bar power plant at 240 kV or alternatively at 138 kV at the Rossdale power plant. In addition, there are two points of interconnection at 69-kV which could be used in emergency situations. Edmonton Power and Calgary Power exchange energy as need arises.

At the date of the hearing electric needs in the Lambton area were served by the Hardisty and Strathcona substations, located north and west respectively of the proposed Lambton substation. The Lambton load area includes existing industrial loads, industrial land in process of being developed, and some residential subdivisions.

On 10 June 1975 the Board wrote to Edmonton Power and the interveners advising that it was prepared to grant the application subject to the approval of the application by the Minister of the Environment and the Minister of Energy and Natural Resources with respect to matters affecting the environment. A copy of the form of the Board's letter is attached as Appendix I. The purpose of this report is to set out the position of each of the parties at the hearing and to present in more detail the Board's disposition of the application.

2. DEFINITION OF THE ISSUES

The Board considers the issues of this application to be

1. the need for the substation and 240-kV transmission line;
2. the location of the proposed substation and transmission line.

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[1] 1 MW = 1,000 kilowatts (kW).

[2] 1 GWh = 1,000,000 kilowatt-hours (kWh).

In addition one of the interveners raised the matter of the reimbursement of an intervener's costs in analysing and presenting an alternative route.

3. THE NEED FOR THE SUBSTATION AND 240-kV TRANSMISSION LINE

3.1 Views of the Applicant

Edmonton Power stated that the existing power supply facilities in the area of the proposed substation were reaching their capacity and that the Lambton substation and 240-kV connection to Calgary Power's transmission lines were required to provide electric energy to the growing industrial and residential load in the Lambton area. In this connection and in confirmation of matters raised at the hearing, Edmonton Power submitted to the Board an engineering report on its proposed system expansion plans for the Lambton area. The applicant indicated that the proposed Lambton substation would be located near the centre of the load thereby minimizing the length of distribution circuits. The proposed location of the substation would also be consistent with Edmonton Power's philosophy of locating substations uniformly throughout its distribution area. It further stated that the 240-kV interconnection with Calgary Power's transmission lines would provide an additional point of supply for the city and thereby increase reliability of service to the Lambton load area.

Edmonton Power's projection showed that the load to be supplied by the Lambton substation would grow from 27 MVA[3] in 1975 to approximately 55 MVA in 1980 and 82 MVA in 1990. Original plans called for the Lambton substation and associated 240-kV transmission line to be commissioned by April 1975, but in response to questioning the applicant indicated that it would suffice to have the proposed new facilities in service by 1 October 1975.

Edmonton Power indicated that in the event the substation was not in operation by that date it would have to construct some temporary facilities to provide adequate service to the Lambton service area.

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[3] 1 MVA = 1,000,000 volt-amperes, a measure of electric load.

While Calgary Power did not comment directly on the need for the substation it did state that it had hoped the facilities would have been in operation about a year ago. Furthermore it contended that a connection of the proposed substation and transmission line with the Calgary Power system "is out of the question" during the winter period (October to April) because of potential voltage problems and inadequate backup facilities.

None of the other interveners expressed views on the need for the substation; however Mr. Desorchers questioned whether the substation was needed as urgently as indicated by the applicant.

3.2 Views of the Board

The Board accepts Edmonton Power's evidence that its electric energy supply facilities in the southeast area of the city "are reaching their capacity". The Board also generally agrees with the City's forecast of rapidly increasing electric energy requirements for this part of the city. The proposed plan to supply electric energy to this area by connection with the Calgary Power system appears reasonable and desirable. The Board therefore concludes that there is a need for the proposed substation and transmission line.

In assessing whether the proposed facilities are urgently required or could be delayed without serious consequences, the Board has considered several matters. The fact that existing facilities are being used to near capacity and that requirements in the area are increasing rapidly indicates a potentially serious situation. This situation is compounded by the fact that the peak energy requirements occur during the winter period, which substantiates the evidence of Calgary Power - accepted by the Board - that the tying-in of the proposed facilities could occur only during the summer period. Thus, increased supply facilities for the 1975-76 winter would require completion of the substation and transmission line by the end of September 1975. The Board agrees with Edmonton Power that temporary facilities or system changes could compensate for a delay in connecting the proposed facilities, but the Board believes that this could have an unfavourable impact on system reliability and would have the further disadvantage of requiring substantial incremental expenditures. All things considered, the Board believes that the proposed substation and transmission line is urgently required and should be in operation by the end of 1975.

4. THE LOCATION OF THE PROPOSED SUBSTATION AND TRANSMISSION LINE

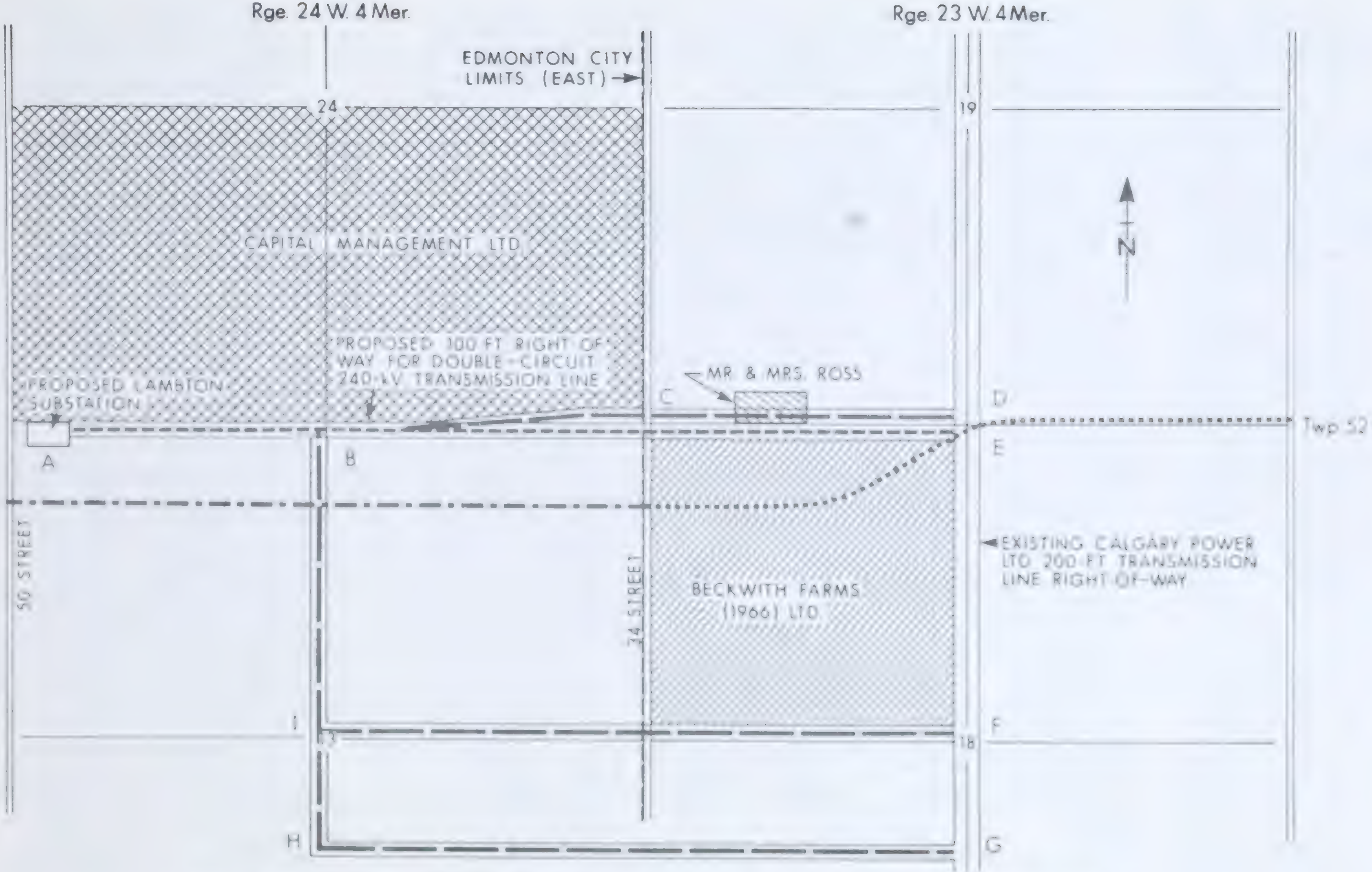
4.1 Views of the Applicant

In presenting only the proposed location for the Lambton substation, the applicant argued that this would be centrally located in the Lambton load area, permit shorter distribution circuits, and result in a more even distribution of load on the substations in the City's service area.

With respect to the 240-kV transmission line, the applicant presented the proposed route and three alternatives which could be used to connect the proposed Lambton substation to Calgary Power's 240-kV transmission line. The four routes are shown in the following map. Of the alternatives, Edmonton Power considered ABIHG as the most desirable from a land assembly standpoint, but a representative of the City of Edmonton's planning department, who appeared on behalf of Edmonton Power, regarded this route as highly undesirable from a planning viewpoint since it was approximately twice as long as the preferred route and would occupy needed industrial land. It would also conflict with a possible service centre at 42 Street and 58 Avenue, as well as affect access to the Mill Woods district and to industrial parcels of land fronting on 42 Street. Portion HG of this alternate would also run directly north of a residential subdivision in Mill Woods and be undesirable from an aesthetic point of view. It was further pointed out that portion HG would run along one of Calgary Power's existing transmission line rights-of-way which, at the City's request, is to be relocated. The City therefore contended that locating the proposed transmission line along this section would not be logical. Edmonton Power stated that the incremental costs for alternate ABIHG would be approximately $200 thousand.

Alternate route ABIF would present similar conflicts in that it too would use valuable industrial land, affect access to industrial parcels facing 42 Street, and be aesthetically undesirable with respect to the use of 42 Street as an approach road to the Mill Woods residential subdivision. Edmonton Power noted that a section of alternative route ABIF would also cross the lands owned by Beckwith Farms. The incremental cost for this route was estimated to be about $160 thousand.

Edmonton Power presented alternative route ABCD principally to avoid crossing Fulton Creek and the lands owned by Beckwith Farms, but pointed out that this would cross four other major parcels of land owned by different persons. This route includes a deflection from the south to the north side of the section boundary, and would probably oblige the


Rge. 24 W. 4 Mer.
Rge. 23 W. 4 Mer.
EDMONTON CITY LIMITS (EAST)
24
19
18
13
N
CAPITAL MANAGEMENT LTD.
PROPOSED 100 FT. RIGHT OF WAY FOR DOUBLE-CIRCUIT 240-kV TRANSMISSION LINE
PROPOSED LAMBTON SUBSTATION
MR. & MRS. ROSS
A
B
C
D
E
F
G
H
I
Twp. 52
50 STREET
34 STREET
BECKWITH FARMS (1966) LTD.
EXISTING CALGARY POWER LTD. 200-FT. TRANSMISSION LINE RIGHT-OF-WAY

MAP SHOWING SUBSTATION AND TRANSMISSION LINE PROPOSALS

- - - - - - - EDMONTON POWER'S PROPOSED LAMBTON SUBSTATION AND TRANSMISSION LINE
—— —— ALTERNATE ROUTES FOR 240-kV TRANSMISSION LINE
— · — · — APPROXIMATE LOCATION OF RIGHT-OF-WAY FOR 58 AVENUE WITHIN CITY LIMITS
············ APPROXIMATE LOCATION OF RIGHT-OF-WAY FOR 58 AVENUE AS SUBMITTED BY BECKWITH FARMS

City to purchase more land than would otherwise be required solely for the transmission line right-of-way. The representative of the City of Edmonton's planning department pointed out that this alternative route had not been incorporated into outline plans for certain industrial parcels which had already been approved by the City. The incremental cost associated with alternative route ABCD would be approximately $80 thousand.

Edmonton Power maintained that the proposed route ABE was the most desirable for a 240-kV interconnection with Calgary Power's transmission line. It would be the most direct, would affect the least number of landowners, and would be the least costly of the routes considered.

Edmonton Power indicated that it was aware of potential problems in constructing the transmission line along the proposed right-of-way in the northwest quarter of Section 18. This section is owned by Beckwith Farms which objected to the proposed route. Edmonton Power submitted a report at the hearing which explained how the transmission line would cross the tree-covered area adjacent to Fulton Creek, along the northern boundary of the northwest quarter of Section 18, and presented plans for this crossing. Edmonton Power contended that only a 10-foot-wide strip along the full extent of this area would be required and would not seriously affect its function as a shelter belt and vegetation screen. Calgary Power, which will build the line on behalf of Edmonton Power, stated that it believed it would be necessary to clear only a 10-foot-wide section at either end of the tree-covered area adjacent to Fulton Creek. Edmonton Power presented a report from the City of Edmonton's planning department which supported the applicant's proposals and expressed the view that crossing the Fulton Creek area with the proposed transmission line would not jeopardize future use of this area for recreational purposes.

4.2 Views of the Interveners

Beckwith Farms objected to that portion of the proposed route which crossed the northwest quarter of Section 18, Township 52, Range 23, west of the 4th Meridian. In support of the objection, a planning analysis by Makale, Holloway and Associates, Ltd. was presented which assessed the environmental impact of constructing a transmission line across the tree-covered part of the Fulton Creek area. This report considered that construction of the proposed transmission line across Beckwith Farms' property would seriously affect the existing stand of trees as a screen from the property to the north and reduce its effectiveness as a windbreak for farm animals. The report also questioned whether the right-of-way of the proposed transmission line, if placed along the proposed route, would be available for future recreational use by the public.

Speaking of the report prepared by his firm, Mr. Makale pointed out that routing the transmission line along the proposed right-of-way was inconsistent with sound planning in that much-needed industrial land would be used, and that an alternative was available. He believed that locating the transmission line along a proposed main thoroughfare, 58 Avenue, would be more consistent with the corridor concept which the City of Edmonton had used in the past. Mr. Makale pointed out that the location of 58 Avenue had been fixed within the city limits by adoption of an outline plan, and he believed that the County of Strathcona would adopt an outline plan which continued a right-of-way for 58 Avenue across Beckwith Farms' property. However, he stated that Beckwith Farms was not opposed to a transmission line along 58 Avenue since this would have a lesser impact on the eventual subdivision of Beckwith Farms' property for industrial use. Mr. Makale did not consider any of the alternate routes presented by Edmonton Power to be acceptable to Beckwith Farms.

In response to Edmonton Power's proposal to cut a 10-foot-wide strip through the tree-covered area at the northern edge of Beckwith Farms' property, a representative of Makale, Holloway and Associates noted that such a trim-line would require removal of a significant portion of foliage from some of the mature trees and that it would have a significant impact on their future growth.

Mr. and Mrs. D. K. Ross, who own a portion of the alternative right-of-way ABCD, objected to the routing because it would have a detrimental effect on immediate plans to develop a parcel of land for industrial use along portion CD. It was proposed to use this property for the storage and maintenance of caisson drilling rigs and this would present a safety hazard, if the transmission line were located along CD, since the large booms of the rigs could contact the high-voltage transmission line. In addition, it was pointed out that present access to their property was from 34 Street and that alternative route ABCD could affect access to the parcel of land. Also, this alternative route would effectively prohibit the use of a significant portion of their land from future industrial subdivision.

Capital Management also opposed alternative route ABCD since in its opinion portion BC of this route would affect a portion of an industrial park which had received the approval of the City of Edmonton. As no right-of-way for a transmission line had been included in its outline plan approved by the City, this intervener did not consider a routing along BC acceptable. The intervener did not, however, oppose the proposed route ABE, which would run south of the southern boundary of its property.

Calgary Power supported the proposed transmission line route and pointed out that when its 240-kV transmission line, to which Edmonton Power would connect, was built, an especially strong tower was located specifically at point E to facilitate the connection of a double-circuit transmission line to the proposed Lambton substation. Calgary Power stated that if one of the alternative routes were approved it would be necessary to move or add an additional transmission-line tower in order to make the connection. The additional cost was estimated at between $8 thousand and $15 thousand, depending on the point of connection. Calgary Power also stated that the outages required for moving or adding an extra-strong tower could not be tolerated after September 1975 when customer requirements would dictate that these lines supply electric energy on a continuous basis. For these reasons, Calgary Power favoured the approval of the proposed route.

4.3 Views of the Board

Evidence at the hearing indicated that while Edmonton Power had made application to construct and operate the Lambton substation, construction of it had actually commenced some months previously and at the time of the hearing was approximately 70-per-cent complete. In the Board's view this action was contrary to the express provisions of The Hydro and Electric Energy Act and cannot be condoned. The Board expects that in future Edmonton Power will comply with all statutory and regulatory requirements. The Board wishes to emphasize that in considering the subject applications it had no regard for the fact that construction of the substation had already commenced.

The Board is satisfied that the proposed location of the Lambton substation is appropriate since it would be centrally located within the Lambton load area, thereby providing economic benefits through shorter distribution circuits.

The Board has carefully considered the advantages and disadvantages of the proposed transmission-line route and each alternative. In addition, it has considered the route suggested by Beckwith Farms recognizing that should this turn out to be the preferred route it would require an application by Edmonton Power together with public advertising.

With respect to the alternative routes BIF and BHG the Board believes that since these routes would result in substantial incremental construction costs and the dedication of significantly more land to transmission-line facilities, and since they were supported by neither the applicant nor any intervener, they should be considered no further.

With respect to the 58 Avenue alternative suggested by Beckwith Farms, the Board believes that construction costs and land dedication would be somewhat greater than for either the proposed route or alternative BCD. The Board's principle concern with that route, however, is one of time: if the 58 Avenue route were selected, how soon could the transmission line be operational? With respect to the planning stage, the Board has been advised by the County of Strathcona that it has approved, in principle, the outline plan incorporating 58 Avenue but that its plan also requires the approval of the Edmonton Regional Planning Commission. Furthermore, the County has no firm plans for construction of 58 Avenue and it is likely that if and when construction occurs it would be carried out in stages over an extended period. In view of these uncertainties the Board believes there would be serious difficulties in selecting a transmission-line route now that would closely tie in with the prospective 58 Avenue.

Notwithstanding the difficulties of route selection, if the Board were to opt for the 58 Avenue suggestion over those routes proposed by the applicant, such would require an application to the Board, subsequent advertising, and the likelihood of a further public hearing. Assuming a favourable decision by the Board, the City of Edmonton would then no doubt have to proceed with the necessary land acquisition. Having regard for these procedural matters, it is clear to the Board that selection of a 58 Avenue route would cause a delay of several months in the completion of the transmission line and consequently new supply facilities would not be available for the 1975-76 winter period. Furthermore, having regard for the uncertainties in the actual development of 58 Avenue, the Board believes that there is some doubt as to whether the transmission line would actually be operational for the winter of 1976-77.

Route BCD represents a relatively minor modification of the proposed route. While it was not supported by Beckwith Farms, the Board believes that since it would avoid the latter's property it would nevertheless be preferable to the proposed route. Route BCD was, however, opposed by two interveners. The Board believes that a transmission line along this route would be somewhat more expensive to construct than that proposed and would require dedicating somewhat more land. The major issues, however, stemmed from the objections of Capital Management and Mr. and Mrs. Ross concerning the alternative route rather than Beckwith Farms' objection to the proposed route. The Board believes that the impact on Capital Management could be significant in view of the industrial development planned for the area and approval by the Municipal Planning Commission of the City of Edmonton. A somewhat similar situation applies to the lands owned by Mr. and Mrs. Ross. With respect to Beckwith Farms' objections, the Board recognizes that the proposed route could have a detrimental impact on the tree-covered area adjoining their northern boundary, but believes the line could be constructed here in a manner optimizing the location of towers and minimizing tree-cutting. Thus, the Board believes the environmental impact would not be serious. All things considered, the Board believes that the proposed route had fewer disadvantages than alternative BCD.

The Board is prepared to approve the proposed location for the substation and route ABE for the construction of a double-circuit 240-kV transmission line. It would require the applicant to obtain the Board's approval of the location of towers and the plan of tree-clearing on Beckwith Farms' lands before construction could proceed.

4.4 Ministerial Approval

The Hydro and Electric Energy Act, section 10, subsection (1), provides that the Board shall refer an application for a permit to construct to the Ministers of the Environment and of Energy and Natural Resources for their approval of the application as it affects matters of the environment.

The Board has acted accordingly and has received their approval of the application insofar as it affects matters of the environment. The approvals of the respective ministers have been incorporated as appendices to the Board's proposed permits and licences which are set out in Appendices II and III of this decision. The Board has made its proposed permits subject to the same conditions imposed by the Ministers of the Environment and of Energy and Natural Resources when they gave their approval.

5. THE REIMBURSEMENT OF AN INTERVENER'S COSTS IN ANALYSING AND PRESENTING AN ALTERNATIVE ROUTE

5.1 Views of the Interveners

Mr. Desrochers stated that his client, Beckwith Farms, had gone to considerable expense to present to the Board an alternate transmission-line route which in his opinion should have been considered and presented by the applicant. While he recognized that legislation did not empower the Board to direct the payment of costs he raised the matter for consideration by the applicant.

Mr. Thomas, representing Mr. and Mrs. Ross, supported Mr. Desrochers. Edmonton Power expressed no views on the subject.

5.2 Views of the Board

Although the Board appreciates that substantial costs may have been incurred by the interveners in the preparation and presentation of their submissions, the Board, in the absence of statutory authority, considers the matter of costs to be within the discretion of the applicant, and accordingly expresses no views on the matter.

6. DECISION

Having regard for its reponsibilities under The Hydro and Electric Energy Act, and subject to the approval of the Minister of the Environment and the Minister of Energy and Natural Resources with respect to matters affecting the environment, the Board is prepared to issue permits to construct and licences to operate a 240-kV double-circuit transmission line and a 240-kV substation, known as the Lambton substation. In addition the Board is prepared to issue an order to connect the double-circuit transmission line to Calgary Power's transmission line in the area.

The permits, licences, and order would be in the form set out in Appendices II, III, and IV, and would be subject to the terms and conditions therein contained.

Vernon Millard
Vice Chairman

September 2, 1975

APPENDIX I

Dear Sirs:

Application No. 8149
Lambton Substation and 240-kV Transmission Line

Following the hearing of Application No. 8149 on 12 May 1975 by Edmonton Power for a permit to construct and a licence to operate a transmission line in the Edmonton area, it has come to the Board's attention that an early decision by the Board on the application may be critical to the applicant's project. Although the Board is reluctant to issue a decision without reference to its reasons therefor, in view of the urgency expressed by the applicant the Board has issued its decision in the form of a one-page statement, a copy of which is enclosed for your information.

The Board expects to issue a formal report containing a discussion of and the reasons for its decision in the near future, at which time a copy will be forwarded to you.

The requisite permits and licences for the transmission line will be issued to Edmonton Power if and when the application is approved by the Minister of the Environment and the Acting Minister of Lands and Forests. The Board's permits and licences will be subject to the terms and conditions contained therein and to any conditions which may be imposed by the Minister of the Environment and the Acting Minister of Lands and Forests.

Yours truly,

C. J. Goodman, Manager
Hydro and Electric Department

/a
encl.

Application No. 8149

Edmonton Power

Lambton Substation and 240-kV Transmission Line

The Board, having publicly heard an application by Edmonton Power under sections 9, 11, and 14 of The Hydro and Electric Energy Act, for approval of the construction and operation of a substation, designated as the Lambton substation, and of a 240-kV double-circuit transmission line; and having studied the evidence submitted by the applicant and the interveners at a public hearing on 12 May 1975, is prepared to grant the application subject to the approval of the application by the Minister of the Environment and the Acting Minister of Lands and Forests insofar as the application affects matters of the environment.

N. Berkowitz
Board Member

APPENDIX II

FORM OF PERMIT AND LICENCE

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of a permit and licence to the City of Edmonton authorizing the construction and operation of a transmission line in the southeast area of the city of Edmonton

PERMIT AND LICENCE NO. EP 75-1

WHEREAS the City of Edmonton applied to the Energy Resources Conservation Board for a permit to construct and a licence to operate a 240-kV double-circuit transmission line in the southeast Edmonton area with circuits designated 904L West and 904L North; and

WHEREAS the Board is prepared to grant the application subject to the conditions herein contained, and the Minister of the Environment and Minister of Energy and Natural Resources have given their approval, hereto attached, insofar as the application affects matters of the environment.

THEREFORE, the Energy Resources Conservation Board, pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, hereby grants to the City of Edmonton (hereinafter called "the Operator") a PERMIT to construct and a LICENCE to operate a 240-kV double-circuit transmission line with circuits designated as 904L West and 904L North, subject to the provisions of the Act and regulations and orders pursuant thereto and to the following terms and conditions:

1. The route of the transmission line shall be as shown on the map attached as Appendix A to this permit and licence.

2. Specifications of the approved double-circuit transmission line shall be and include as follows:

(a) all structures to be of metal construction,

(b) each circuit of the double-circuit transmission line to be designed and built for 240-kV operation,

(c) the line to be operated at a nominal voltage of 240-kV,

and as more particularly described in an application to the Board from the Operator, dated 24 October 1974, and evidence presented at a public hearing on 12 May 1975.

3. (1) The Operator prior to commencement of any right-of-way clearing, or construction of the transmission line herein permitted, shall file with the Board a plan, showing

(a) the location of towers, and

(b) proposed disturbance of natural vegetation and trees

and shall obtain the Board's approval thereof.

(2) Notwithstanding any other provision hereof, the Operator, during construction, operation, or maintenance of the said transmission line shall minimize the disturbance or removal of natural vegetation and trees along the route of the transmission line.

4. The Operator shall, within 30 days of the completion of the construction of the transmission line, satisfy the Board that such construction has been in accordance with the provisions of this Permit and Licence and The Electrical Protection Act and regulations and orders pursuant to that Act.

5. Within 30 days of the time the transmission line is first energized, the Operator shall notify the Board that the transmission line has been energized and is operating within the specified voltage range.

6. Insofar as it pertains to matters of the environment, this Permit and Licence is subject to the Minister of the Environment's approval, hereto attached as Appendix B, and to the terms and conditions therein contained.

7. Insofar as it pertains to matters of the environment, this Permit and Licence is subject to the Minister of Energy and Natural Resources' approval, hereto attached as Appendix C, and to the terms and conditions therein contained.

8. (1) Subject to subclause (2), the Operator shall satisfy the Board within one year of the date hereof that construction of the transmission line as permitted herein has been completed.

(2) On its own motion or upon the application of an interested party, the Board may stipulate such later date for completing construction of the transmission line as it considers suitable under the circumstances.

9. The Board may

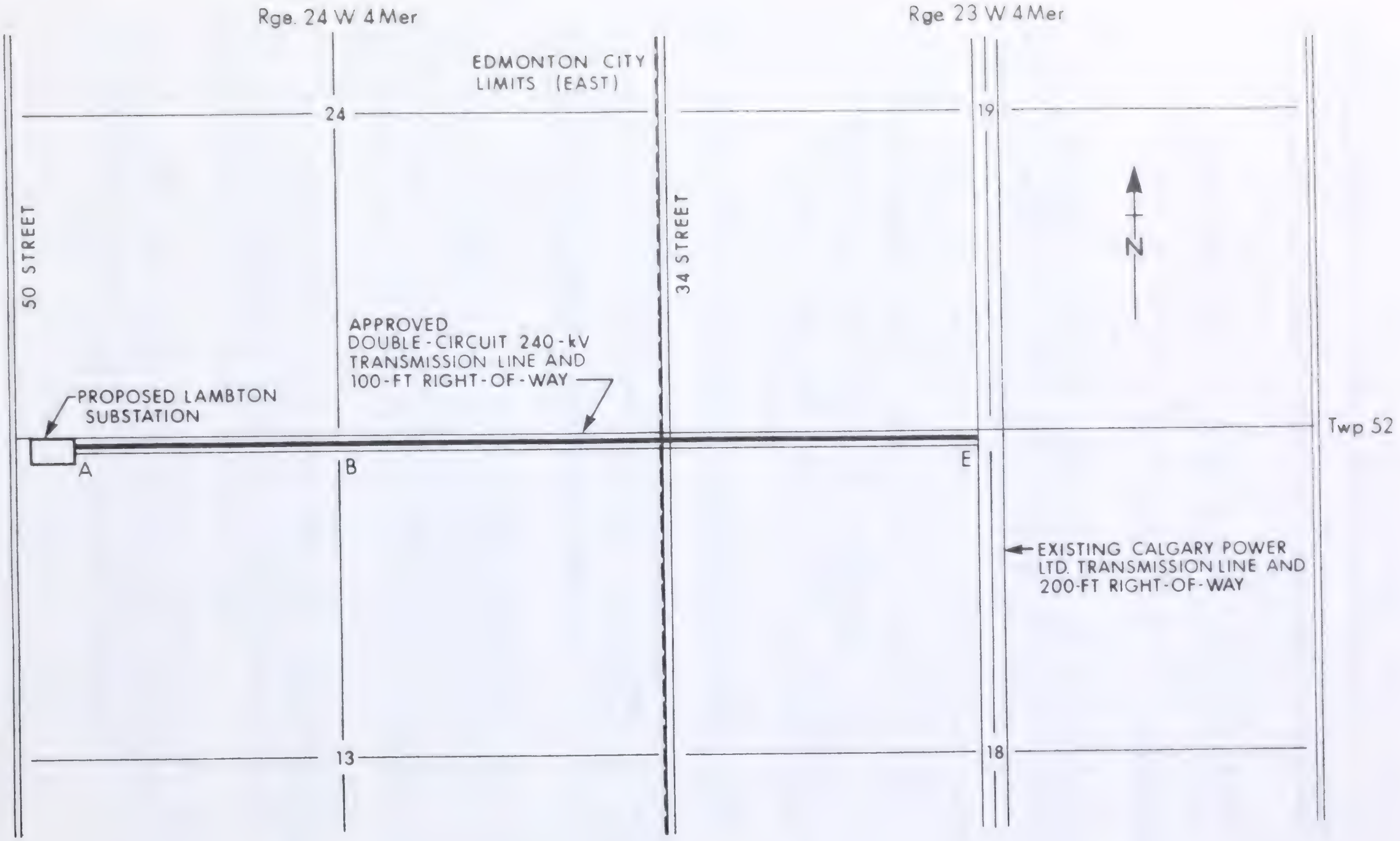
(a) cancel or suspend this Permit and Licence, in whole or in part, for failure of the Operator to comply with any provision of the Act, the regulations, or the terms and conditions set out herein, or

(b) amend this Permit and Licence as it deems suitable in the circumstances.

DATED at the City of Calgary, in the Province of Alberta, this day of , 1975.

ENERGY RESOURCES CONSERVATION BOARD

Vernon Millard
Vice Chairman


Rge. 24 W 4 Mer
Rge 23 W 4 Mer
EDMONTON CITY LIMITS (EAST)
24
19
50 STREET
34 STREET
N
APPROVED DOUBLE-CIRCUIT 240-kV TRANSMISSION LINE AND 100-FT RIGHT-OF-WAY
PROPOSED LAMBTON SUBSTATION
Twp 52
A
B
E
EXISTING CALGARY POWER LTD. TRANSMISSION LINE AND 200-FT RIGHT-OF-WAY
13
18

APPENDIX A MAP SHOWING APPROVED EDMONTON POWER TRANSMISSION LINE

APPENDIX B TO PERMIT AND LICENCE NO. EP 75-1

Department of the Environment

MINISTERIAL APPROVAL

No. 75 - 151 ERCB

Edmonton, Alberta
August 27, 1975

Pursuant to section 10 of The Hydro and Electric Energy Act, I, D. J. Russell, Minister of the Environment, hereby approve Application No. 8149, dated October 24, 1974, from the City of Edmonton to the Energy Resources Conservation Board in the matter of the 240-kV double-circuit transmissi line from the Lambton substation to Calgary Power Ltd.'s transmission line 904L, insofar as it affects matters of the environment.

for E. Kupchanko
MINISTER OF THE ENVIRONMENT

APPENDIX C TO PERMIT AND LICENCE NO. EP 75-1

Department of Energy and Natural Resources

MINISTERIAL APPROVAL

No. ERCB

Edmonton, Alberta
1975

Pursuant to section 10 of The Hydro and Electric Energy Act, I, D. R. Getty, Minister of Energy and Natural Resources hereby approve Application No. 8149, dated October 24, 1974, from the City of Edmonton to the Energy Resources Conservation Board in the matter of a 240-kV double-circuit transmission line from the Lambton substation to Calgary Power Ltd.'s transmission line 904L, insofar as it affects matters of the environment.

MINISTER OF ENERGY AND NATURAL RESOURCES

APPENDIX III

FORM OF PERMIT AND LICENCE

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of a permit and licence to the City of Edmonton authorizing the construction and operation of a transmission line in the southeast area of the city of Edmonton

PERMIT AND LICENCE NO. EP 75-2

WHEREAS the City of Edmonton applied to the Energy Resources Conservation Board for a permit to construct and a licence to operate a transmission line designated as the Lambton substation (hereinafter called "the Substation") in the southeast area of Edmonton; and

WHEREAS the Board is prepared to grant the application subject to the conditions herein contained, and the Minister of the Environment and Minister of Energy and Natural Resources have given their approval, hereto attached, insofar as the application affects matters of the environment.

THEREFORE, the Energy Resources Conservation Board, pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, hereby grants to the City of Edmonton (hereinafter called "the Operator") a PERMIT to construct and a LICENCE to operate the Substation subject to the provisions of the Act and regulations and orders pursuant thereto and to the following terms and conditions:

1. The Substation shall be wholly located in the northwest quarter of Section 13, Township 52, Range 24, west of the 4th Meridian.

2. Specifications of the Substation shall be and include as follows:

(a) two - 50/66.7-MVA, 240/14.4-kV transformers,

(b) four - 240-kV circuit breakers,

(c) a steel link fence enclosing the substation,

(d) associated substation equipment,

and as more particularly described in an application to the Board from the Operator, dated 24 October 1974, and evidence given at the public hearing on 12 May 1975.

3. The Operator shall satisfy the Board within 30 days of the completion of the construction of the Substation that such construction has been in accordance with the provisions of this Permit and Licence and The Electrical Protection Act and regulations and orders pursuant to that Act.

4. The Operator shall notify the Board, within 30 days of the time that the Substation is first energized, that the Substation has been energized and is operating within the specified voltage range.

5. Insofar as it pertains to matters of the environment, this Permit and Licence is subject to the approval of the the Minister of the Environment, hereto attached as Appendix A, and to the terms and conditions therein contained.

6. Insofar as it pertains to matters of the environment, this Permit and Licence is subject to the approval of the Minister of Energy and Natural Resources, hereto attached as Appendix B, and to the terms and conditions therein contained.

7. (1) Subject to subclause (2), the Operator shall satisfy the Board within one year of the date hereof that construction of the Substation as permitted herein has been completed.

(2) On its own motion or upon the application of an interested party, the Board may stipulate such later date by which construction of the Substation is to be completed, as it considers suitable under the circumstances.

8. The Board may

(a) cancel or suspend this Permit and Licence, in whole or in part, for failure of the Operator to comply with any provision of the Act, the regulations, or the terms and conditions set out herein, or

(b) amend this Permit and Licence as it deems suitable in the circumstances.

DATED at the City of Calgary, in the Province of Alberta, this day of , 1975.

ENERGY RESOURCES CONSERVATION BOARD

Vernon Millard
Vice Chairman

APPENDIX A TO PERMIT AND LICENCE NO. EP 75-2

Department of the Environment

MINISTERIAL APPROVAL

No. 75 - 152 ERCB

Edmonton, Alberta
August 27, 1975

Pursuant to section 10 of The Hydro and Electric Energy Act, I, D. J. Russell, Minister of the Environment, hereby approve Application No. 8149, dated October 24, 1974, from the City of Edmonton to the Energy Resources Conservation Board in the matter of the Lambton substation insofar as it affects matters of the environment.

for MINISTER OF THE ENVIRONMENT

APPENDIX B TO PERMIT AND LICENCE NO. EP 75-2

Department of Energy and Natural Resources

MINISTERIAL APPROVAL

No. ERCB

Edmonton, Alberta
1975

Pursuant to section 10 of The Hydro and Electric Energy Act, I, D. R. Getty, Minister of Energy and Natural Resources, hereby approve Application No. 8149, dated October 24 1974, from the City of Edmonton to the Energy Resources Conservation Board in the matter of the Lambton substation insofar as it affects matters of the environment.

per MINISTER OF ENERGY AND NATURAL RESOURCES

APPENDIX IV

FORM OF ORDER

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

ORDER NO. Misc HE 7508

An order regarding the electric transmission
system of the City of Edmonton in the
southeast Edmonton area

WHEREAS the City of Edmonton applied to the Energy Resources Conservation Board for an order to connect its proposed 240-kV double-circuit transmission line from its Lambton substation to Calgary Power Ltd.'s transmission line designated 904L.

THEREFORE the Energy Resources Conservation Board, pursuant to The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, hereby orders as follows:

1. The City of Edmonton shall construct and operate a 240-kV double-circuit connection with Calgary Power Ltd.'s transmission system as described in clause 2.

2. The specifications of the connection shall be as follows:

    (a) the point of connection to Calgary Power Ltd.'s transmission system shall be in the vicinity of the intersection of the north-south centre-line of Section 18, Township 52, Range 23, west of the 4th Meridian, with its northern boundary, and

    (b) a double-circuit interconnection with each circuit of three phases operating at 60 hertz and approximately 240,000 volts line-to-line with a circuit capacity of approximately 300 MVA.

3. The Board at any time,

   (a) upon its own motion, or

   (b) upon the application of an interested person,

may rescind or amend this Order.

MADE at the City of Calgary, in the Province of Alberta, this day of , 1975.

ENERGY RESOURCES CONSERVATION BOARD

Vernon Millard
Vice Chairman

ENERGY RESOURCES CONSERVATION BOARD

Decision 75-11
Application No. 8224

Construction and Modification of Transmission Lines and Substations Near Lake Wabamun

1 INTRODUCTION

1.1 The Application and Hearing

Calgary Power Ltd. submitted Application No. 8224 under sections 9, 11, and 17 of The Hydro and Electric Energy Act to construct and modify transmission and substation facilities in the vicinity of the Sundance and Wabamun power plants near Lake Wabamun.

A public hearing was held by the Energy Resources Conservation Board in Edmonton on 26 June, 1975 to consider this application with V. Millard, N. Berkowitz, and G.J. DeSorcy, P.Eng., sitting.

1.2 Appearances

The following table lists the parties that appeared at the hearing:

Table of Participants

NOTE: Abbreviations shown in parentheses are used in this report.

Name	Represented by	Witnesses
Calgary Power Ltd. (Calgary Power)	H.M. Kay	E.J. MacLeod, P.Eng. R.E. Keyes, P.Eng. S.C. Johnson B. Vik
Mrs. N. Henkel	C.E. Power	Mrs. N. Henkel Mr. N. Henkel H. Stahl
Energy Resources Conservation Board staff (Board staff)	A.L. McLarty W.L. McVeigh	

1.3 Background

Calgary Power operates two thermal power plants near the eastern end of Lake Wabamun, approximately 45 miles west of Edmonton. Major transmission lines from the Wabamun plant on the north side of the lake and from the Sundance plant on the south side of the lake, serve loads to the north, south and east. All the lines from Sundance run southeast from the plant between the cooling pond and Lake Wabamun. Near the eastern end of the cooling pond the lines turn east onto a 390-ft right of way for approximately three miles (see Figure 1). At the eastern end of this three-mile section the transmission lines diverge to north, south and east.

During 1974 and 1975 the Board approved (Permit and Licence Nos. CP 74-1 and CP 75-4) the construction by Calgary Power of two major 240-kV transmission lines, CP 908L and CP 909L, respectively east from the Sundance plant to the Edmonton area. Currently the Board has before it applications from Alberta Power Limited and Calgary Power (Application Nos. 8310 and 8015 respectively) to upgrade transmission line 713L/913L north to Barrhead and Mitsue from 144 kV to 240 kV.

Application No. 8224, discussed in this report, involves new construction and the modification of existing facilities as detailed in section 1.4. The application was advertised for objections and one objection was received regarding the proposed route of the new transmission line. Because no other interventions were received this report concentrates particular attention on the proposed transmission line route.

1.4 The Application

The present configuration of transmission lines in the Wabamun-Sundance area is shown in Figure 2. Figure 3 shows the rearrangement proposed by Calgary Power. The specific items for which Calgary Power has requested permits and licences or approvals are:

a) construction of approximately six miles of 240-kV double-circuit steel-tower transmission line east of the Sundance plant,

b) use of the two proposed new circuits to rearrange circuits CP 902L, CP 903L, CP 908L and CP 909L and bring circuits CP 190L and CP 913L into Sundance substation CP 310P,

c) changing the termination of the Wabamun-Benalto-Sarcee 240-kV transmission line CP 190L from the Wabamun substation CP 19S to the Sundance substation CP 310P,

d) extending the Wabamun-Barrhead-Mitsue 240-kV transmission line CP 913L so it terminates at the Sundance substation CP 310P,

e) changing the Sundance substation CP 310P to accommodate the terminations of 240-kV transmission lines CP 190L and CP 913L, and

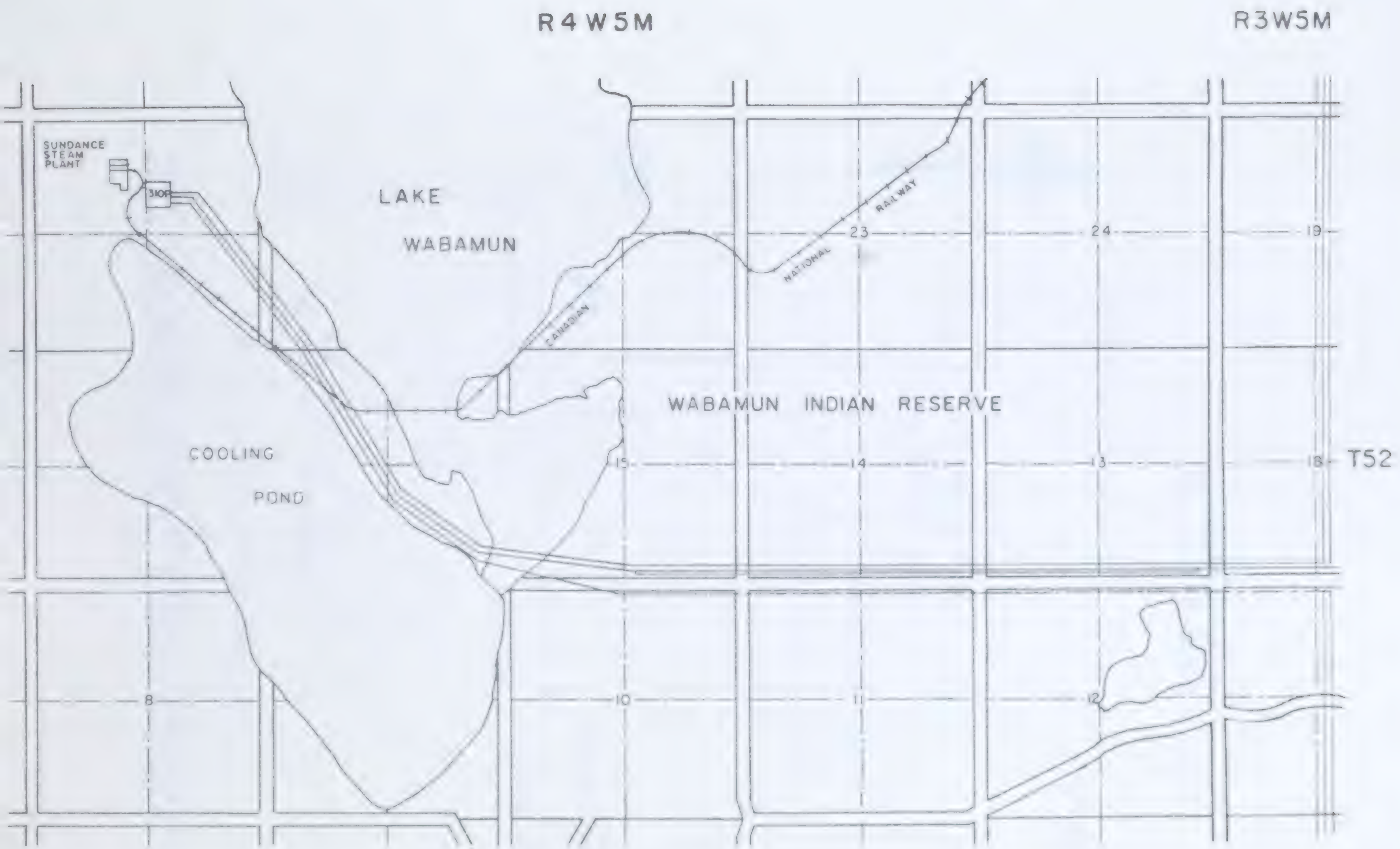


FIGURE 1 - EXISTING AND PROPOSED TRANSMISSION LINES EAST OF SUNDANCE

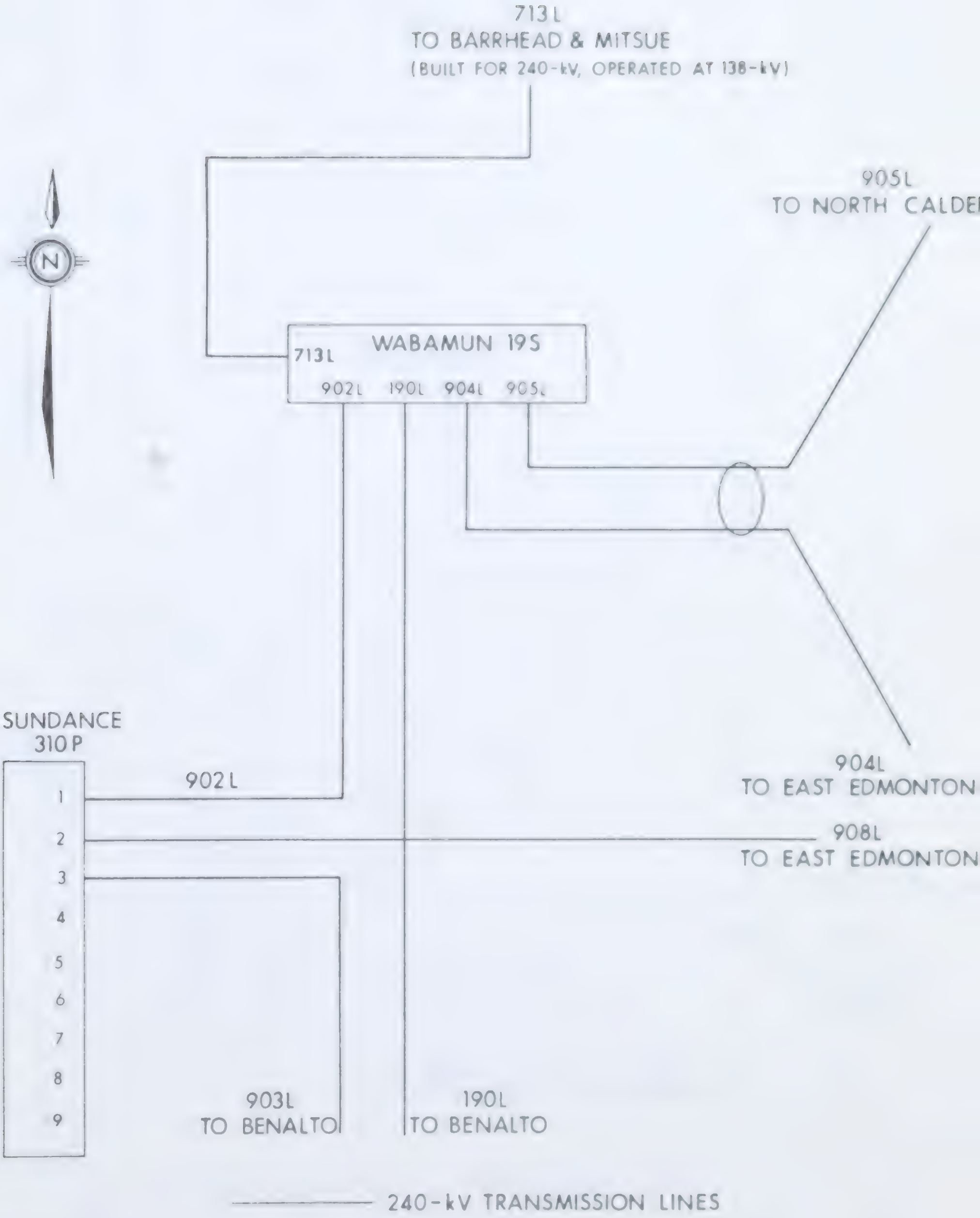


FIGURE 2 - SINGLE LINE DIAGRAM OF EXISTING CONFIGURATION OF MAJOR TRANSMISSION LINES IN THE SUNDANCE-WABAMUN AREA

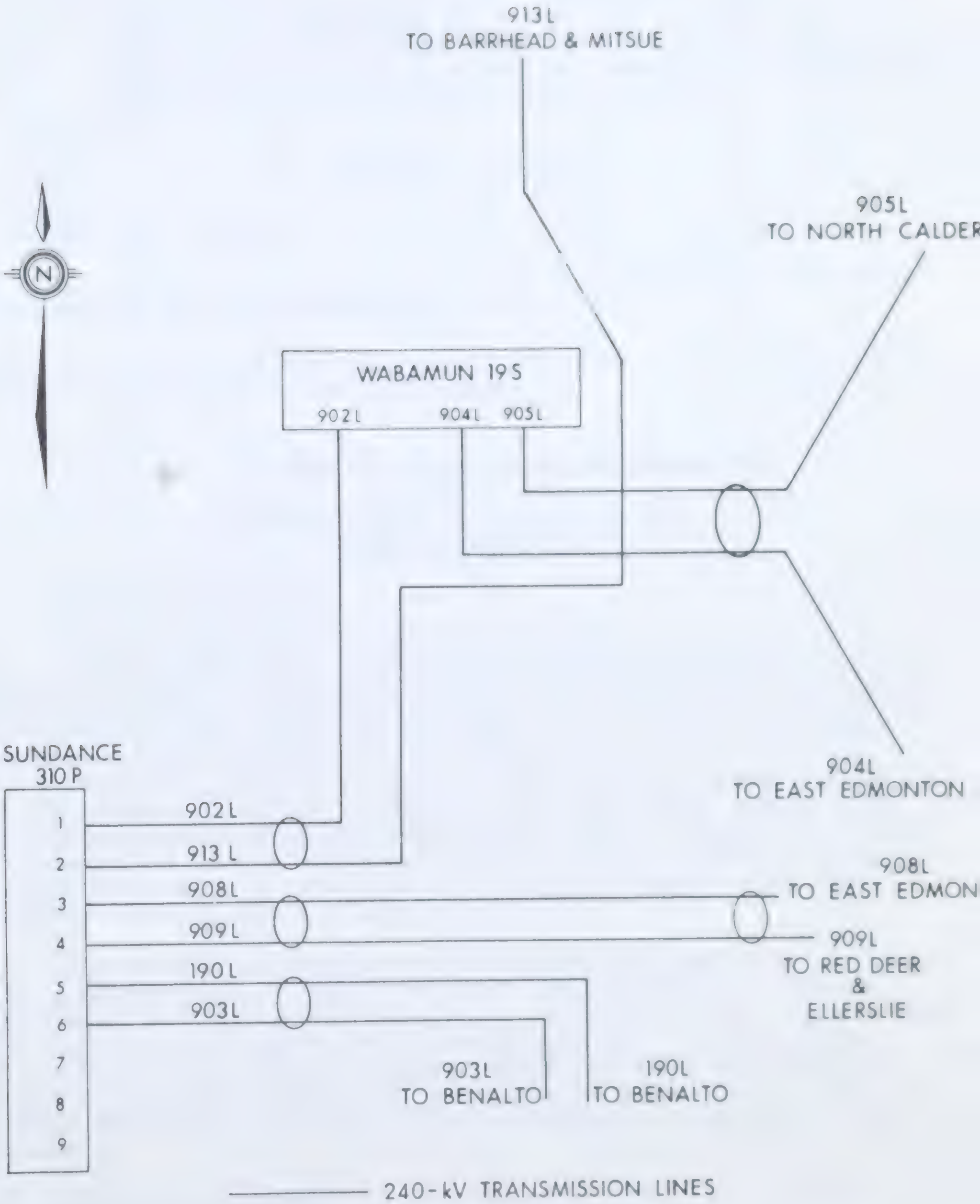


FIGURE 3 - SINGLE LINE DIAGRAM OF PROPOSED FUTURE CONFIGURATION OF MAJOR TRANSMISSION LINES IN THE SUNDANCE-WABAMUN AREA

f) at the Wabamun substation CP 19S removing one 240-kV circuit breaker and de-energizing one 138-kV circuit breaker on which transmission lines CP 713L to Mitsue and CP 190L to Sarcee respectively presently terminate, and increasing the interrupting rating of the remaining 240-kV circuit breakers.

2 DEFINITION OF ISSUES

The Board considers that the issues to be resolved are:

1. The need for the new line east of Sundance and the rearrangement of circuits in the Wabamun-Sundance area.

2. The route of the easternmost three miles of the proposed double-circuit transmission line east of Sundance.

3 THE NEED FOR THE NEW LINE EAST OF SUNDANCE AND THE REARRANGEMENT OF CIRCUITS IN THE WABAMUN-SUNDANCE AREA

3.1 Views of the Applicant

Calgary Power said that the growth of generation capacity at the Sundance power plant in recent years had resulted in the need to rearrange transmission lines in the Wabamun-Sundance area. The Wabamun power plant was constructed first (in stages beginning in 1956), and so the initial transmission lines from this area to the major loads in the south and east were fed from this plant. With construction of the Sundance plant and its planned and approved future growth, most of the energy generated in the Wabamun-Sundance area would now originate there. Calgary Power said the existing tie line, CP 902L, between the two plants generally carried energy from Sundance to Wabamun so as to supply the transmission lines presently originating at the latter plant.

With the changes proposed in this application, two lines, CP 713L/913L to the north and CP 190L to the south, originating at the Wabamun plant, would be re-routed to originate at the Sundance plant. Calgary Power said that this would enable the increasing generation capacity at the latter plant to supply the increasing loads served by CP 713L/913L and CP 190L. Also these changes would reduce the loading on the tie line, CP 902L, and maintain a capacity for the transfer of energy between the two plants.

3.2 Views of the Intervener

Mr. Power, representing Mrs. Henkel, said he neither agreed nor disagreed with the need for the new line and the rearrangement of circuits and left that decision to the Board.

3.3 Views of the Board

With the completion of Unit No. 3 at Sundance, now scheduled for the first half of 1976, the total net plant capacity would be some 914 MW. Given that a 240-kV transmission line of the design used by Calgary Power has a nominal capacity of 200 MW, six such lines would be required to ensure adequate transmission capacity with one line out of service. Calgary Power's proposal would result in six 240-kV lines originating at Sundance. On the basis of the above, the Board agrees with Calgary Power that there is a need for the new line and the rearrangement of circuits as proposed.

4 THE ROUTE OF THE EASTERNMOST THREE MILES OF THE PROPOSED DOUBLE-CIRCUIT TRANSMISSION LINE EAST OF SUNDANCE

4.1 Introduction

In order to facilitate the construction of the large cooling pond that the applicant was previously ordered to construct at the Sundance site, it was necessary to rearrange the western sections of the double-circuit transmission lines within the narrow corridor between the cooling pond and Lake Wabamun. This work was carried out on land owned by the applicant.

At the time the cooling pond was being constructed, Calgary Power built three sets of double-circuit 240-kV transmission-line towers in the area between the cooling pond and Lake Wabamun. At the time of the hearing the lines on one of the tower sets were designated CP 902L and CP 908L, while only one operating line, CP 903L, was carried on a second of the sets of towers.

East of the cooling pond, there are existing structures for four lines - two sets of single-circuit towers and one set of double-circuit towers. The construction of a second set of double-circuit towers here would provide positions for six circuits for approximately the first six miles east from the Sundance plant.

One of the landowners in the area where the new construction would take place objected and suggested that an alternative route be found.

A general map of the entire six-mile route is shown in Figure 1 and more specific sketches of the proposed route and alternatives in the area of the intervener's property, described below, are given in Figures 4 to 9.

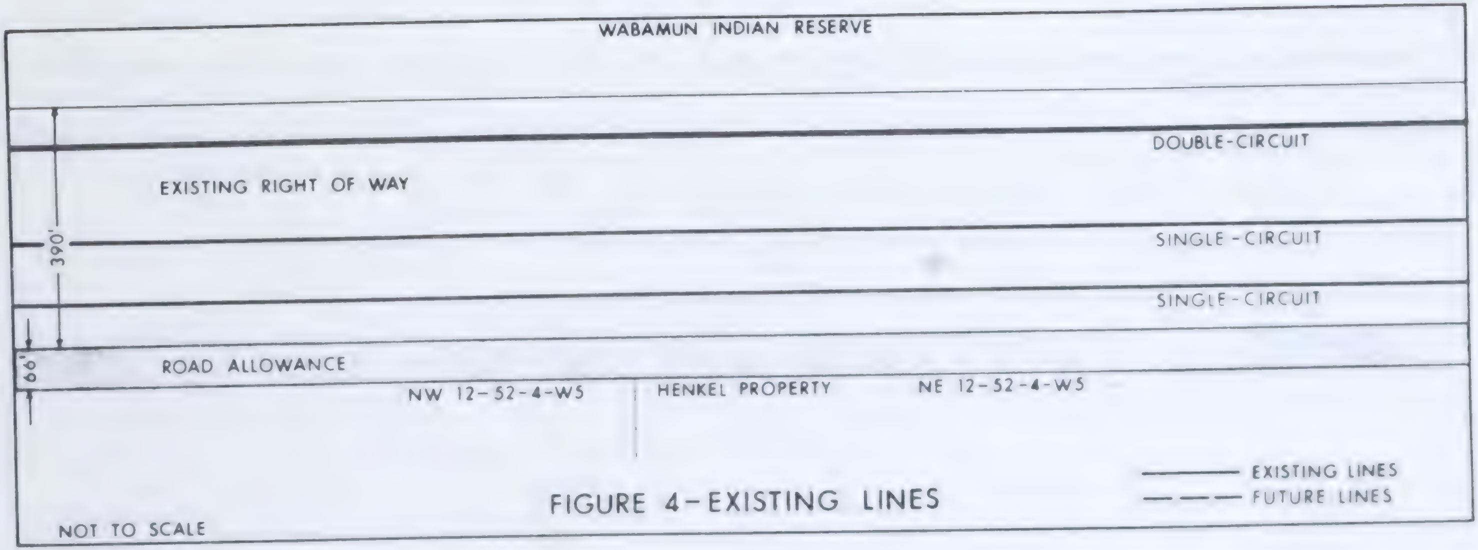


FIGURE 4-EXISTING LINES

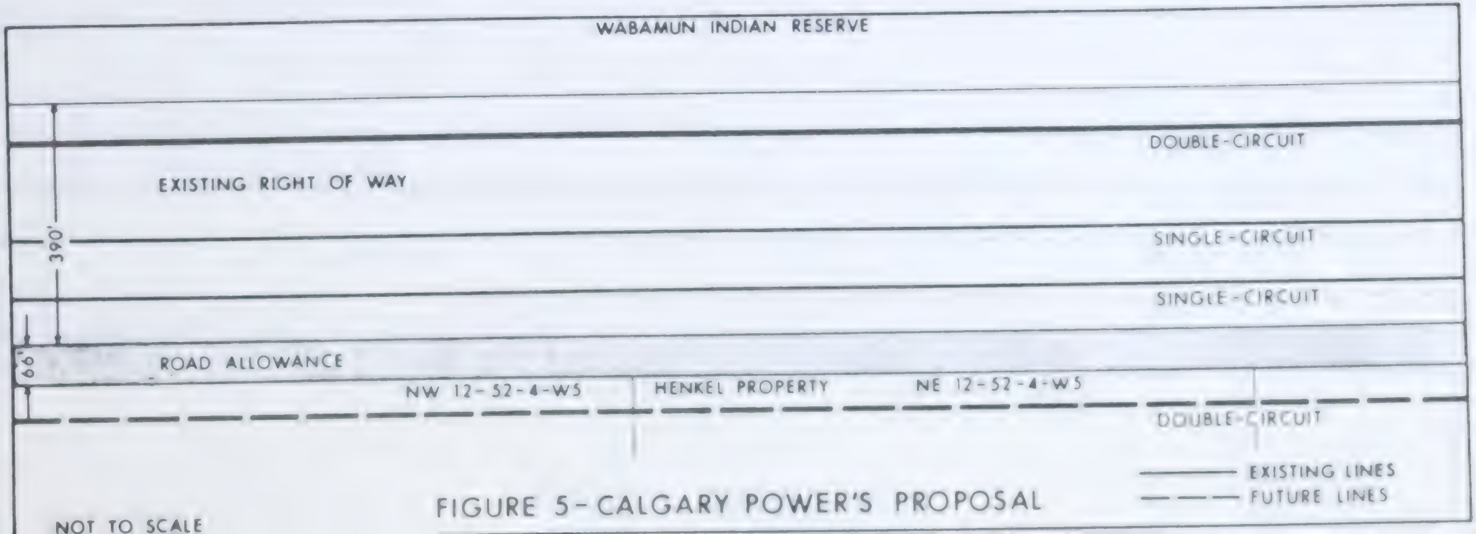


FIGURE 5-CALGARY POWER'S PROPOSAL

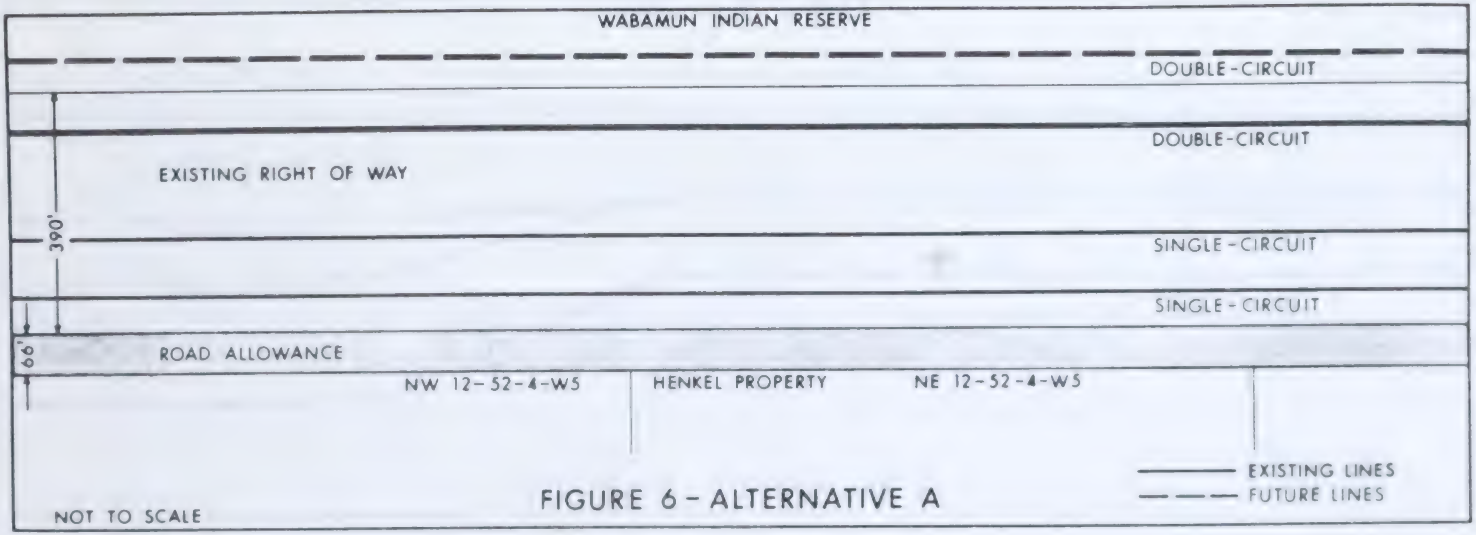


FIGURE 6 - ALTERNATIVE A

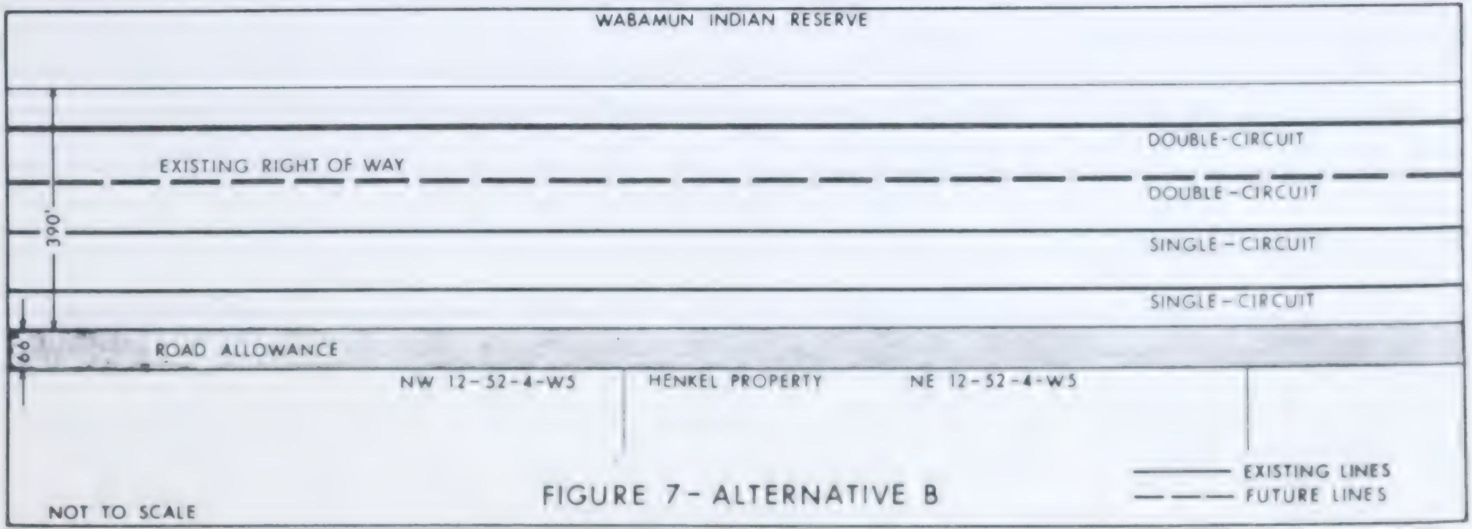


FIGURE 7 - ALTERNATIVE B

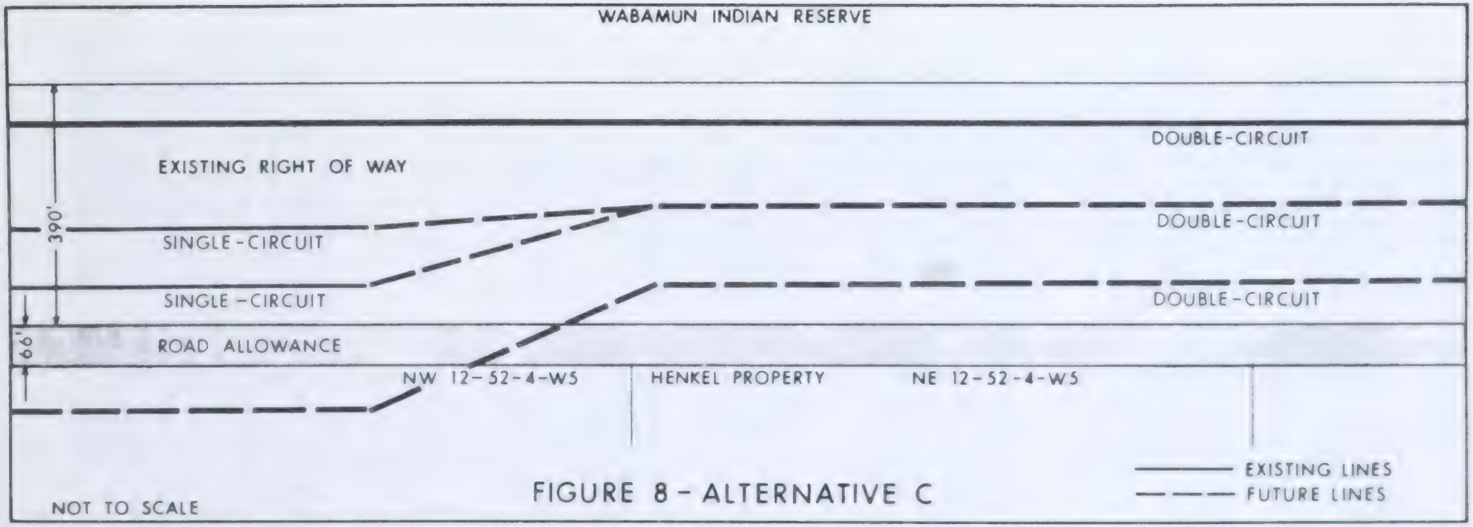


FIGURE 8 - ALTERNATIVE C

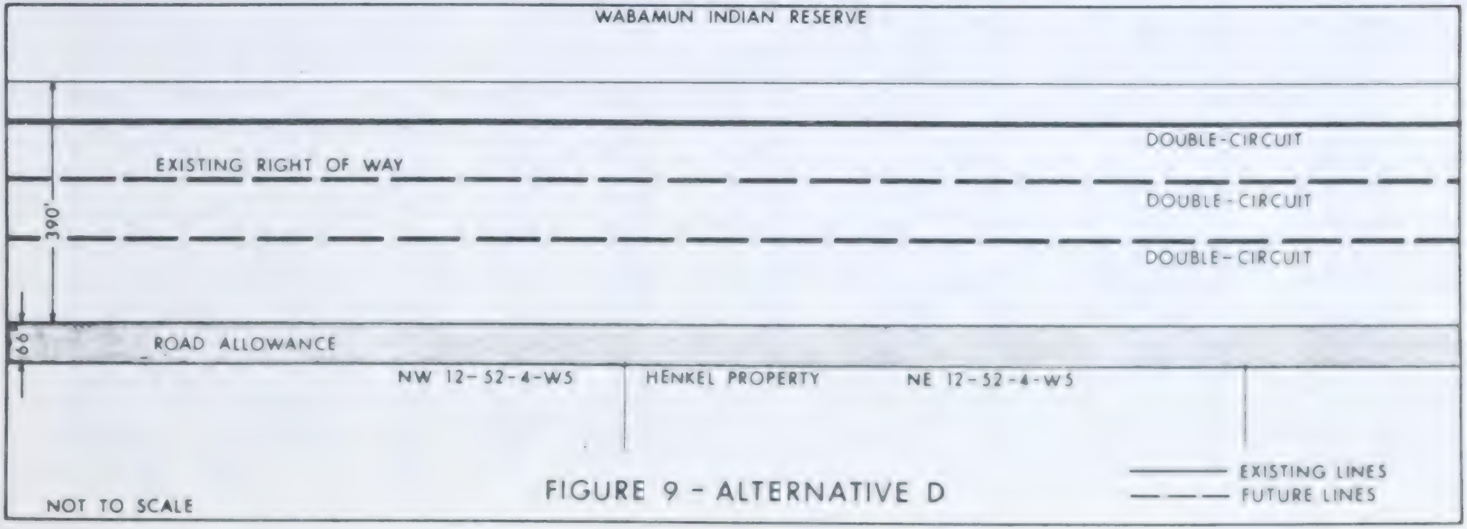


FIGURE 9 - ALTERNATIVE D

4.2 Views of the Applicant

Calgary Power proposed construction of six miles of double-circuit 240-kV transmission line east from the Sundance plant (see Figure 1). For the easternmost three miles Calgary Power suggested the route be south of the road allowance which in turn is immediately south of Calgary Power's existing 390-ft transmission-line right of way.

Calgary Power had originally proposed a 220-ft right of way, but at the hearing amended its application by reducing the proposed width to 80 ft in response to environmental concerns and the Henkels' building plans. Calgary Power said that, since the County of Parkland restricted buildings within 125 ft of a road allowance, the 80-ft right of way would not physically conflict with the construction of houses on the Henkels' land.

Calgary Power favoured its proposed route because it best suited the existing arrangement of lines (see Figures 4 and 5), and would be less costly than any of the alternative routes, all of which required extra tower construction and as many or more cut-overs to connect the circuits. A line along the proposed route would take the least time to construct, resulting in the shortest interruption time for the existing lines.

Calgary Power argued against the following four alternatives:

Alternative A	North of the existing 390-ft right of way (see Figure 6);
Alternative B	On the 390-ft right of way between the existing double-circuit line and the northernmost single-circuit line (see Figure 7);
Alternative C	On the 390-ft right of way for the half-mile required to avoid the Henkels' property (see Figure 8); and
Alternative D	On the 390-ft right of way with the two existing single-circuit lines replaced by one double-circuit line (see Figure 9).

Regarding alternative A, Calgary Power said it had not approached the Paul Band, residing on the Wabamun Indian Reserve, because the land for the existing right of way was taken on the Indian Reserve, on three separate occasions, and Calgary Power considered that a sufficient contribution to the transmission corridor in that area. Calgary Power also said that if the band refused to provide additional right of way at a price agreeable with the applicant, expropriation was not possible because federal land was involved. This alternative would require more cut-overs at the east and west ends of the three-mile section than the proposed route, and possibly some additional towers. Calgary Power estimated the additional cost, mostly for labour, at between $50 thousand and $75 thousand. It would take a crew two days to cut over one end of one circuit.

Calgary Power said alternative B was possible; however the spacing between conductors would be less than the 50 ft it considered the minimum distance for good design, and Mr. Keyes recommended this alternative not be built. The applicant noted that, within the corridor between the cooling pond and Lake Wabamun where the conductor-to-conductor spacing was less than 50 ft, the spans from tower to tower varied between 814 and 934 ft allowing closer spacing of the conductors because of less sag and swing-out. On this alternative route the spans would have to be approximately 1,200 ft in order that the towers be adjacent to the existing double-circuit towers.

Calgary Power said alternative C was feasible; however, the additional cost would be $125 thousand. This extra cost was attributed mainly to the four angle towers required to divert the line around the Henkel's property. These angle towers are approximately four times heavier than the tangent towers.[1] On the basis of figures provided by Calgary Power the cost of materials and installation for an angle tower was approximately $26 thousand compared to approximately $6,500 for a tangent tower.

Alternative D was considered possible, but the additional construction would result in an extra cost of $117 thousand. Calgary Power said the 390-ft right of way could provide space for four double-circuit lines with at least 50-ft spacing between conductors. Mr. MacLeod contended that while a fourth double-circuit (circuits 7 and 8) line east or south from Sundance would probably be built, it was unlikely that it would be built adjacent to the existing lines for reasons of reliability.

Calgary Power said the width of right of way it chose would be dependent upon the value of the land among other things. If the land was particularly expensive the line would be designed with shorter spans and more towers so that a narrower right of way could be used and adequate clearances still maintained. It said the land cost in this area would not be a major expense and estimated the value at an average of $200 per acre.

4.3 Views of the Intervener

The submission on behalf of Mrs. Henkel objected to the 220-ft right of way initially proposed by Calgary Power. The objections were in regard to the impact of the line on access to the northwest corner of the quarter-section, the clearing of trees to build the transmission line, and the overall environmental impact on the property.

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[1] Tangent towers are those used to support the transmission-line conductors on a straight alignment. At any point where the line veers appreciably from a straight alignment a stronger, heavier tower is required.

Mr. Henkel contended that the reduction in right-of-way width to 80-ft would not lessen the original objections. Because of the topography of the land, in particular the steep slopes near the lake, the narrower right of way would still interfere with access. As well the majority of the most attractive trees on the property, the spruce, were within 80 ft of the north boundary of the quarter.

Mr. Power, representing Mrs. Henkel, referred to the provision in the Hydro and Electric Energy Act requiring the Board to assist the Government in ensuring conservation of the environment. He said Calgary Power's proposals were based only on monetary considerations and it had not demonstrated a real need for additional land. He suggested that conservation of the environment would best be served if Calgary Power made better use of its existing 390-ft right of way. He said that, alternatively, the line could be built on the Indian Reserve land which was not as attractive as the Henkel property. He noted Calgary Power had not even approached the Indian band.

Mr. and Mrs. Henkel indicated that because of the tree cover the best site for homes on their quarter-section was in the northwest corner. They said they planned to use that area for homes in the future for themselves and other members of their family. The Henkels said that presently the land was kept in a fairly natural state and the lake and land used for recreation.

Mr. Stahl, a realtor, gave evidence for the Henkels regarding possible commercial use of their property. He said he was impressed with the beauty of the property and its potential for development as a resort area comparable to that at Lake Eden. He suggested that cabins could be built by individuals leasing the land, and a ski hill developed. If the land were subdivided for homes, he estimated the land value would be approximately $3 thousand to $4 thousand per acre. The northern portion of the property offered the best development potential in Mr. Stahl's opinion. Mr. Henkel indicated that although these development options were open to them, their intention was to maintain the land in its present natural condition until they built their family homes.

4.4 Views of the Board

The Board considered the proposed route and alternative routes with respect to technical feasibility, environmental impact and efficient development.

4.41 Alternative A - North of the Existing 390-ft Right of Way

The Board believes that the route located on the Wabamun Indian Reserve immediately north of the existing right of way would have the advantage of avoiding the Henkel property and thereby eliminating the environmental impact on the area adjacent to the small lake. The Board also agrees with the intervener that this alternative route would be more suitable in terms of land use, since the land on the Indian reserve is sparsely wooded and rolling, and does not contain a spruce stand or lake as found on the proposed route.

On the other hand, compared to the proposed route, this route would require an additional expenditure of some $50 thousand to $75 thousand, and the transmission of electric energy from the Sundance plant would have to be interrupted significantly longer in order to realign the existing transmission lines and tie in the new one. The Board estimates that the interruption in transmission would be equivalent to one 240-kV line being out of service for eight to ten days. This is significant, both as a loss of capacity to transfer energy generated at Sundance and as a factor increasing the vulnerability of the system should additional lines trip out during the winter peak-load period. The Board accepts the applicant's argument that such an interruption would be unacceptable at that time. The Board also recognizes that, should this route be selected, Calgary Power would have to make arrangments with the Paul Indian Band to acquire the land. Negotiations might not be successful or might be seriously protracted and there would be no recourse for expropriation. There is, therefore, considerable uncertainty associated with this alternative.

All things considered, the Board finds that the disadvantages of this route are serious and significantly outweigh its advantages. The Board therefore considers it unacceptable.

4.42 Alternative B - On the 390-ft Right of Way Between the Existing Double-Circuit Line and the Northernmost Single-Circuit Line

The Board agrees with the applicant that locating a double-circuit line between the existing one and the northernmost single-circuit line would not be advisable. Calculations by the Board staff indicate that the proposed transmission line could be built on this route and meet the safety requirements of the proposed Electrical Protection Act. However, the spacing would be less than required to satisfy adequate engineering design and, given the future dependence of the provincial load on electric energy supplied by the Sundance plant, the Board believes this to be an unacceptable risk. The Board recognizes that lines in the corridor between the cooling pond and Lake Wabamun are also located close to each other and that allowance was made for this by reducing the span length, thus limiting the sag and swing-out of the conductors. A similar adjustment on the 390-ft right of way would require rebuilding the existing line at substantial additional cost.

4.43 Alternative C - On the 390-ft Right of Way for the Half-Mile Required to Avoid the Henkels' Property

The Board is in general agreement with the applicant's estimate that an extra $125 thousand would be required to by-pass the Henkels' property only. Not only is this excessive relative to the lessened impact of the proposed new right-of-way, but for less, $117 thousand, the two existing single-circuit lines could be replaced throughout their length by double-circuit lines. This would confine all new construction to the existing right-of-way and the Board therefore believes that alternative D should be preferred to alternative C.

4.44 Comparison of Alternative D - Rebuilding of the existing Single-Circuit Lines - and the Applicant's Proposed Route

The two remaining possibilities are the route proposed by the applicant and the alternative of replacing the two existing single-circuit lines by two double-circuit ones. The Board agrees with the intervener that the latter alternative would make more efficient use of the existing 390-ft right of way whereas the proposed route would have an undesirable environmental impact on the Henkels' property and use more land throughout its length. Furthermore, the alternative could provide sufficient space for the future construction of a fourth double-circuit transmission line on the existing right of way. However, the alternative would require a further expenditure of $117 thousand and a more lengthy interruption of service on the existing lines.

In order to evaluate the efficient use of the right-of-way, the Board believes that the advantages of concentrating several lines in a narrow corridor must be weighed against any resulting reduction in reliability. Four double-circuit transmission lines represent an energy transfer capability equivalent to more than half the 1975 peak load of the entire Alberta system, and the simultaneous loss of eight such closely-spaced circuits could cause a widespread blackout. At the hearing Calgary Power advised that it would be applying for additional transmission lines from the Sundance plant, but it did not expect to apply for them to be located in the existing corridor. The Board subscribes to this view and in fact believes that system reliability dictates that it would be imprudent to locate any additional future transmission lines either in the narrow corridor between the cooling pond and the lake or on the 390-ft right of way. The Board therefore concludes that space for additional lines will not be required, consequently no advantages for future construction will accrue by replacing the single-circuit lines now. A further consequence is that the full cost of rebuilding must be weighed against the environmental impact of the proposed line.

The Board has examined carefully the evidence regarding the impact on the Henkels' property. The proposed line would require two or three towers located on the quarter-section. Most of the required right-of-way is free of trees and would require no clearing. The Board concurs with the intervener that most of the spruce stand is located in what would be the 80-ft right of way. By the use of an extended tower in the adjoining quarter-section or at the west end of the property the Board believes that Calgary Power could reduce to an insignificant amount any tree clearing and probably any tree trimming. With respect to the matter of access to the northwest corner of the property the Board does not believe the presence of the transmission line would have any significant impact. Notwithstanding the above conclusion the Board recognizes that the presence of the transmission line would have an undesirable overall impact. However, it cannot agree that the impact is sufficient to warrant the expenditure of $117 thousand which would have to be borne by Calgary Power's customers. The Board therefore concludes that the alternative of rebuilding the single-circuit lines should not be selected and that the proposed route should be approved. It notes that some modest additional cost will be involved in the special construction required to reduce the impact of the line on the Henkels' spruce trees. Calgary Power will be required to submit plan and profile drawings of the proposed towers and tower locations on the Henkels' property to the Board for its approval prior to right-of-way preparation and line construction.

The Board notes that the third, fourth and fifth generating units have been approved and a sixth unit proposed at the Sundance plant, yet the applicant's plans for future energy transmission from Sundance remain indefinite. While the Board appreciates that large generating units require a considerably longer construction lead time than the associated transmission lines do nevertheless it is of the opinion that the energy transfer and transmission planning should be carried out along with that for generation. Accordingly, the Board expects that future applications for generating units will show the general location and feasibility of proposed and alternative energy transfer corridors. Also, at least two full years prior to the first energy being available from a new generating unit, applications for adequate associated transmission lines on specific proposed and alternative routes are to be submitted to the Board. Such applications will be expected to demonstrate compatibility with the overall system transmission planning scheme developed and submitted in connection with all applications for additional generating capacity.

5 MINISTERIAL APPROVAL

The Hydro and Electric Energy Act, section 10, subsection (1), provides that the Board shall refer an application for a permit to the Ministers of the Environment and of Energy and Natural Resources for their approval of the application as it affects matters of the environment. The Board has acted accordingly and the respective approvals, if given, would be incorporated as appendices to the Board's proposed permits and licences. Also the Board would make its permits subject to any conditions imposed by the Ministers of the Environment and of Energy and Natural Resources in their approvals.

6 DECISION

Having regard for its responsibilities under The Hydro and Electric Energy Act, and subject to the approval of the Ministers of the Environment and of Energy and Natural Resources with respect to matters affecting the environment, the Board is prepared to issue permits and licences for the construction, alteration and operation of transmission lines and substations as applied for in Application No. 8224 and listed in section 1.4 of this report, and in accordance with the views of the Board as expressed in this report.

ENERGY RESOURCES CONSERVATION BOARD

V. Millard
Vice-Chairman

October 27, 1975

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ENERGY RESOURCES CONSERVATION BOARD

Decision 75-12

Applications for Revised Well Spacing and Target Areas in the Medicine Hat Field.

8487 - M-P Petroleum Ltd.

8581 - Calso Partners

8613 - M-P Petroleum Ltd.

8669 - Universal Gas Co. Ltd.

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Examiners:

H.J. Webber, P.Eng.
R.W. Edgecombe, P.Eng.

October 8, 1975

1 INTRODUCTION AND BACKGROUND

M-P Petroleum Ltd., Universal Gas Co. Ltd., and Calso Partners each have submitted applications for special drilling spacing units in an area of the Medicine Hat field located north of the City of Medicine Hat and east of the Suffield Block. As the applications were all submitted during the summer of 1975 and were basically similar in nature the examiners believed they should be considered together.

The lands included in the applications are in a narrow band located between the Suffield Block on the west and the Medicine Hat Gas Unit, operated by Hudson's Bay Oil and Gas Company Limited on the east as shown in Figure 1.

Section 4.020 of the Oil and Gas Conservation Regulations defines the normal drilling spacing unit for a gas well as one section. Section 4.030 of the Regulations states that the Board shall not grant an application to reduce the size of a drilling spacing unit unless the applicant shows that

a) recovery will be improved, or
b) additional wells are necessary to provide capacity to drain the pool at a reasonable rate, or
c) the drilling spacing unit would be in a pool in a substantial part of which there are drilling spacing units of such reduced size, or
d) in a gas field, increased deliverability is desirable.

In considering an application to reduce the size of a drilling spacing unit, the Board has regard for the impact that the proposed well spacing would have on the economics of developing offsetting lands.

Board Order No. SU 800 sets out the normal target areas in the region of application to be L.S.'s 6 and 16 for half-section spacing and L.S.'s 6, 8, 14 and 16 for quarter-section spacing.

Off-target penalty relief is provided by section 4.060 of the Regulations, where geologic, topographic, or other like reasons make it impractical to drill to the specified target areas.

The examiners present certain common findings and then relate them to the individual applications.

In this report the term Milk River refers to the Medicine Hat Milk River A Pool. Medicine Hat or Main Medicine Hat refers to the Medicine Hat Medicine Hat A Pool, and Lower Medicine Hat refers to Medicine Hat Medicine Hat B Pool.

2 APPLICATION NO. 8487 BY M-P PETROLEUM LTD.

2.1 The Application and Hearing

M-P Petroleum Ltd. applied pursuant to section 4.030 of the Oil and Gas Regulations for an order establishing special drilling spacing units of one half section for the production of gas from the Milk River, Medicine Hat, and Lower Medicine Hat zones in six sections in the Medicine Hat Field. In three of these sections, 9, 21 and 35-15-5 W4M, the proposed target areas are L.S.'s 6 and 16 in accordance with Board Order No. SU 800. In the other three sections 8, 27, and 33-15-5 W4M, special target areas are requested due to topographical problems caused by the presence of the South Saskatchewan River and surface access problems created by the Suffield Block. At the hearing, the applicant amended the application as it pertains to section 35-15-5 W4M such that the reduced spacing would apply to only the Milk River and Lower Medicine Hat zones.

A Notice of Hearing was issued respecting the three sections for which special target areas were proposed, and a Notice for Objections was published respecting the others. These notices were published by the Board on June 19 and June 20, 1975. Submissions of intervention to both parts of application were filed by Atlantic Richfield Canada Ltd. and Hudson's Bay Oil and Gas Company Limited. Calso Partners objected respecting the area for which approval of special target areas was requested.

The application was the subject of an examiner hearing conducted by H.J. Webber, P.Eng. and R.W. Edgecombe, P.Eng. on July 14, 1975. Because the interveners to both parts of the application were the same, it was agreed that all six sections would be considered at that hearing. During the hearing, Dana Distributors Ltd. was registered as an intervener with the consent of the applicant and the examiners.

2.2 Appearances

The following appeared at the hearing:

	Represented by
M-P Petroleum Ltd. (M-P)*	W. Sharp, P.Eng. F. Coles, P.Eng.
Altantic Richfield Canada Ltd. (Atlantic Richfield)*	C.W. Demetrick, P.Eng. L.G. Doig, P.Eng.
Calso Partners (Calso)*	K.J. Stoddard, P.Eng. J.R. Downey
Hudson's Bay Oil and Gas Company Limited (Hudson's Bay)*	S.K. Chakravorty, P.Eng.
Dana Distributors Ltd. (Dana)*	E.W. Hadway
Board Staff	R.L. Archibald, P.Eng. D.N.H. Dumka, P.Eng.

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* Abbreviation used in this report.

2.3 Interventions

2.31 Hudson's Bay

Hudson's Bay is the operator of the Medicine Hat Gas Unit No. 1 which is adjacent to two of the sections of application and is within 2 miles of the other four sections. The unit is confined to the Main Medicine Hat formation.

Hudson's Bay submitted that one section drilling spacing units are appropriate for production from the Medicine Hat formation. Hudson's Bay said that the application would force Hudson's Bay to drill unjustified wells in order to prevent drainage.

2.32 Atlantic Richfield

Atlantic Richfield is the operator of a proposed Milk River formation gas unit which is located immediately east of the area of application. In addition, it operates a number of nearby Milk River wells east of this proposed unit.

Altantic Richfield contended that there are insufficient reserves to warrant drilling more than two Milk River wells per section or more than one Lower Medicine Hat well per section.

Atlantic Richfield submitted that approval of Application No. 8487 would force it to drill undesired offsetting wells in order to prevent drainage.

2.33 Calso

Calso Partners are the lessee in sections 22 and 34-15-5 W4M. M-P applied for special target areas consisting of L.S. 7 and L.S. 9 in section 33-15-5 W4M. Although Calso supported the concept of close spacing for gas production from the Milk River, Medicine Hat and Lower Medicine Hat zones, it objected to L.S.'s 7 and 9 being target areas for Medicine Hat and Lower Medicine Hat production. It stated that if two wells in the east half of section 33-15-5 W4 are permitted to produce leaseline inequity through drainage from section 34 would result. For similar reasons Calso also objected to L.S. 2 being the target area in section 27-15-5 W4M.

2.34 Dana

Dana Distributors Ltd. did not present evidence. It only registered as an intervener so as to have the right to cross examine the applicant. Dana stated that two Milk River, one Medicine Hat, and one Lower Medicine Hat wells per section would be the optimum.

3 APPLICATION NO. 8581 BY CALSO PARTNERS

3.1 The Application and Hearing

Grant Trimble Engineering Ltd. on behalf of Calso Partners applied pursuant to section 4.030 of the Oil and Gas Conservation Regulations for an order establishing special drilling spacing units of one half section for gas production from the Medicine Hat and Lower Medicine Hat formations, and one quarter section for gas production from the Milk River formation, in five sections in the Medicine Hat Field. The area of application is sections 22 and 34-15-5 W4M and sections 3, 10 and 23-16-5 W4M. The proposed target areas are in accordance with Board Order No. 800. The Board issued a Notice for Objections in mid-June, 1975. Submissions of intervention were filed by Hudson's Bay Oil and Gas Company Limited, Atlantic Richfield Canada Ltd., Dana Distributors Ltd., and Merland Exploration Ltd. Notice of Hearing was published by the Board on August 2 and August 5, 1975.

The application was the subject of an examiner hearing conducted by H.J. Webber, P.Eng. and R.W. Edgecombe, P.Eng. on August 19, 1975.

3.2 Appearances

The following appeared at the hearing:

	Represented by
Calso Partners (Calso)*	W. Grant Trimble, P.Eng. K.J. Stoddard, P.Eng.
Atlantic Richfield Canada Ltd. (Atlantic Richfield)*	L.G. Doig, P.Eng. C.W. Demetrick, P.Eng.
Hudson's Bay Oil and Gas Company Limited (Hudson's Bay)*	S.K. Chakravorty, P.Eng. L.K. Hennel T.G. Hilling
Board Staff	R.L. Archibald, P.Eng. D.N.H. Dumka, P.Eng.

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* Abbreviation used in this report.

3.3 Interventions

3.31 Dana

Dana has a working interest in sections 21, 27, 33 and 35-15-5 W4M. It stated that the well density proposed by Calso would result in drainage of gas from Dana's land. In order to prevent this, expensive offset drilling would be required. Ultimate recovery would be lessened because of increased operating costs, and early flush production would lead to over-designed production facilities resulting in overcapitalization. Dana was not represented at the hearing.

3.32 Atlantic Richfield

Atlantic Richfield is operator of the proposed Medicine Hat-Milk River Gas Unit No. 1 which is adjacent to three of the sections and is within one mile of the other sections which are included in the area of application.

Atlantic Richfield submitted that approval of Calso's application would force it to drill uneconomic wells in order to prevent drainage. Because of the low reserves it would not be economic to drill more than two Milk River wells per section or more than one Lower Medicine Hat well per section.

3.33 Hudson's Bay

The five sections comprising Calso's area of application border on the western edge of the Medicine Hat Gas Unit No. 1 which is operated by Hudson's Bay. Hudson's Bay stated that 640 acre spacing in the Medicine Hat zone would yield the "most economic ultimate recovery".

4 APPLICATION NO. 8613 BY M-P PETROLEUM LTD.

4.1 The Application and Hearing

M-P Petroleum Ltd. applied pursuant to sections 4.030 and 4.060 of the Oil and Gas Conservation Regulations for an order establishing special drilling spacing units for the production of gas from the Milk River, Medicine Hat, and Lower Medicine Hat formations in section 3-15-5 W4M in the Medicine Hat field. In the north half of the section the proposed spacing unit consists of approximately 242 acres, of which 160 acres are in the northwest quarter and 82 acres are east of the South Saskatchewan River in the northeast quarter, with the proposed target area being L.S. 16. The applicant proposed a drilling spacing unit of 277 acres in the south half of the section; however, at the hearing it amended this to include the entire south half of section 3-15-5 W4M. L.S. 8 is the proposed target area.

Notice of Hearing was published by the Board in early August, 1975. Submissions of intervention were filed by Atlantic Richfield Canada Ltd. and Hudson's Bay Oil and Gas Company Limited.

The application was the subject of an examiner hearing conducted by H.J. Webber, P.Eng. and R.W. Edgecombe, P.Eng. on August 19, 1975.

4.2 Appearances

The following appeared at the hearing:

	Represented by
M-P Petroleum Ltd. (M-P)*	W. Sharp, P.Eng. R.D. Weir
Atlantic Richfield Canada Ltd. (Atlantic Richfield)*	C.W. Demetrick, P.Eng. L.G. Doig, P.Eng.
Hudson's Bay Oil and Gas Company Limited (Hudson's Bay)*	S.K. Chakravorty, P.Eng. L.K. Hennel T.G. Hilling

Board Staff	D.N.H. Dumka, P. Eng.

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* Abbreviation used in report.

4.3 Interventions

4.31 Atlantic Richfield

The area of application, section 3-15-5 W4M. borders on the western edge of Atlantic Richfield's proposed Milk River gas unit. Atlantic Richfield said it feared that approval of Application No. 8613 would compel it to drill uneconomic offsetting wells in order to prevent drainage.

4.32 Hudson's Bay

Hudson's Bay, as operator of the Medicine Hat Gas Unit No. 1, submitted that dense drilling in a section adjacent to its land would force it to drill uneconomic offsetting wells in order to prevent drainage.

5 APPLICATION NO. 8669 BY UNIVERSAL GAS CO. LTD.

5.1 The Application and Hearing

Universal Gas Co. Ltd. applied pursuant to section 4.030 of the Oil and Gas Conservation Regulations for an order establishing special drilling spacing units in two sections of the Medicine Hat field.

Notice of Hearing was published by the Board in early August, 1975. Submissions of interventions were filed by Atlantic Richfield Canada Ltd. and Hudson's Bay Oil and Gas Company Limited.

The application was the subject of an examiner hearing conducted by H.J. Webber, P.Eng. and R.W. Edgecombe, P.Eng. on August 19, 1975. At the hearing, the application was amended to include only one section, 10-15-5 W4M. The proposed spacing units are the north and the south half-sections, and the proposed target areas are L.S.'s 6 and 16, in accordance with Board Order No. SU 800.

5.2 Appearances

The following appeared at the hearing:

	Represented by
Universal Gas Co. Ltd. (Universal)*	W.G. Trimble, P.Eng.
Atlantic Richfield Canada Ltd. (Atlantic Richfield)*	C.W. Demetrick, P.Eng. L.G. Doig, P.Eng.
Hudson's Bay Oil and Gas Company Limited (Hudson's Bay)	S.K. Chakravorty, P.Eng. L.K. Hennel T.G. Hilling
Board Staff	D.N.H. Dumka, P.Eng.

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* Abbreviation used in this report.

5.3 Interventions

5.31 Atlantic Richfield

Section 10-15-5 W4M is adjacent to the proposed Medicine Hat-Milk River Gas Unit No. 1 to be operated by Atlantic Richfield. Atlantic Richfield objected to close spacing which they said would cause inequitable drainage in the Milk River and Lower Medicine Hat zones.

5.32 Hudson's Bay

Hudson's Bay operates unit wells in the Medicine Hat formation in the lands immediately east of the area of application. Hudson's Bay said it believed that one well per section in the Medicine Hat zone is the most economic well spacing. Consequently it objected to Universal's proposed spacing, which would cause Hudson's Bay to drill uneconomic wells in order to prevent drainage.

6 DEFINITION OF THE ISSUES

The examiners have given consideration to the evidence in deciding what the important issues are. The applicants have stated that reduced spacing would allow them to improve their economics and increase ultimate recovery, while the interveners have submitted that it would force them to drill undesirable wells in order to prevent drainage. It was generally agreed that reduced spacing would contribute to an increase in ultimate recovery which would be small relative to the costs. Although this has not been examined in detail, the examiners tend to agree with the participants and, consequently, conservation is not considered to be contentious. Having regard for these general arguments the examiners believe that the issues are:

1. Impact of reduced spacing on equity between owners.
2. Impact of target area revisions on equity between owners.
3. Economic considerations.

7 IMPACT OF REDUCED SPACING ON EQUITY BETWEEN OWNERS

7.1 Views of Calso and Universal

Calso and Universal stated that leaseline inequity is not an issue. The offsetting leaseholders have the same opportunity to develop on close spacing and thereby benefit from the attractive economics.

7.2 Views of M-P

M-P submitted that there is no need for a buffer zone between regions of differing spacing units in this area of application. M-P said that, because of the poor reservoir quality, it does not expect a significant amount of drainage across the leaselines. M-P did not estimate the amount of drainage that could occur.

7.3 Views of Atlantic Richfield

Atlantic Richfield said it favoured the establishment of a "buffer zone" with normal well spacing between areas of different spacing to prevent drainage. However, at the hearing of Application No. 8581, Atlantic Richfield stated that it would object to an application for reduced spacing even where there is separation between its land and the area of application.

7.4 Views of Hudson's Bay

Hudson's Bay submitted that, in order to maintain equity, there should be a buffer zone between areas of different spacing. It would have no objection to the applications if such a zone were established.

7.5 Views of the Examiners

The Board staff conducted a two-dimensional areal model study of the Milk River formation in order to estimate the effect that reduced well spacing has upon production rate and recovery from an adjacent area with normal spacing. Three cases were considered. The first case was the base case in which land on both sides of a leaseline were produced on one section spacing. In the second case the lands on one side of the leaseline were assumed to be developed on 320 acre spacing with target areas in L.S.'s 6 and 16, while the offsetting lands had one section spacing units with targets in L.S. 11. The ultimate recovery of the well in the section on the east side of the leaseline was reduced by about 11 per cent from the base case. In the third case the region west of the leaseline was assumed to have 160 acre spacing with targets in L.S.'s 6, 8, 14, and 16. This reduced recovery from the well in the 640 acre spacing unit by approximately 23 per cent from the base case.

Because of the above and because of the similarities between the three zones involved, the examiners conclude that drainage across leaselines could be substantial in all zones if areas of different spacing, as proposed, were to abut. The examiners believe that leaseline drainage between areas of diverse ownership would be eliminated or reduced to insignificant amounts if the denser spacing were employed in a one mile band within the area which is otherwise on wider spacing or, alternatively, the wider spacing were employed in a one mile band in the area proposed to be developed on denser spacing. In the circumstances pertaining to these applications, where small landholdings are involved, the second alternative is clearly impractical.

8 IMPACT OF TARGET AREA REVISIONS ON EQUITY BETWEEN OWNERS

8.1 Views of M-P

M-P said that its applications for revised target areas were justified on the basis that access to the normal target areas was blocked for the foreseeable future due to the presence of the Suffield Block.

At the hearing M-P agreed that implementation of the proposed special target areas would cause some increase in the drainage of gas from the adjacent sections, relative to that which would occur under normal targets. M-P said it was unable to estimate the amount of such drainage.

8.2 Views of Calso

In section 33-15-5 W4M, M-P's proposed target areas are L.S.'s 7 and 9 while in the south half of section 27-15-5 W4M, L.S. 2 is proposed. Calso submitted that production under these special target areas would increase the drainage from its lands in section 34-15-5 W4M by approximately 10 to 15 per cent of the ultimate reserves and in section 26-15-5 W4M by an even greater amount.

8.3 Views of Atlantic Richfield and Hudson's Bay

Atlantic Richfield and Hudson's Bay both submitted that production under the special target areas would result in inequitable drainage of the neighbouring lands. They stated that section 3-15-5 W4M would be more suitably developed with east and west halves rather than the north and south halves that M-P proposed.

8.4 Views of the Examiners

The examiners believe that the special target areas proposed by M-P for sections 3, 27 and 33-15-5 W4M would lead to inequitable drainage. In section 8-15-5 W4M, M-P proposed that L.S.'s 8 and 10 be the target areas. Because M-P owns the mineral rights in section 9 to the east, the examiners do not believe these target areas would create inequities.

A two-dimensional areal model study of the Milk River reservoir was conducted by the Board staff. In one model case, producing wells were positioned in L.S.'s 6 and 16 of one section, and in L.S. 11 in the adjacent section to the east. In another case the two wells in the western section were moved to L.S.'s 7 and 9. The results indicated that moving the targets from L.S.'s 6 and 16 to L.S.'s 7 and 9 would increase the volume of drainage from the adjacent section by about 15 per cent while decreasing the recovery of the well in this offsetting section to the east by approximately 3 per cent.

The examiners believe that M-P has not provided adequate evidence that access to the westerly target areas is blocked. In any event, the examiners believe that access to the normal target areas may be available within five years due to other proposed gas field developments there. In the meantime, development of M-P's lands may generally proceed on a one well per section basis.

The examiners believe that M-P was or should have been aware that development on reduced spacing of the lands it acquired could be a problem and that this was no doubt reflected in the acquisition considerations.

The examiners find on the balance of the existing evidence that, except as indicated respecting section 8-15-5 W4M, the applications for revised target areas should be denied.

9 ECONOMIC CONSIDERATIONS

9.1 Views of Calso

In its application Calso volumetrically estimated the proved recoverable reserves to be 1.6 billion cubic feet (Bcf) per section for the Milk River and 2.0 Bcf per section for the combined Medicine Hat and Lower Medicine Hat zones. At the hearing, Calso presented an analysis of production decline data, using the harmonic decline method, from wells near the areas of application. This analysis indicated proved recoverable reserves of 1.87 Bcf per section for the Milk River and 3.02 Bcf per section for the Medicine Hat. Based upon net pay assignments, Calso estimated reserves of 0.57 Bcf per section to the Lower Medicine Hat formation. Calso stated that the lower, volumetrically determined reserves should be used in evaluating its application, but that the decline-based reserve volumes are valid estimates.

Calso presented a number of evaluations which showed that the close spacing for which they are applying yields the best economics. These are before-tax calculations which assume the commingling of production in the well bore. Initial flow rates were assumed to be 100 Mcfd for the Milk River, 200 Mcfd for the Main Medicine Hat Sand, and 100 Mcfd for the Lower Medicine Hat.

9.2 Views of M-P

M-P Petroleum estimated reserves by volumetric calculations to be 1.78 Bcf per section in the Milk River and 2.06 Bcf per section in the Medicine Hat and Lower Medicine Hat combined.

M-P's evaluations indicated that 320 acre spacing was more economic than 640 acre spacing. These were based upon initial flow rates of 100 Mcfd for the Milk River, 200 Mcfd for the Medicine Hat, and 50 Mcfd for the Lower Medicine Hat. In addition, it was assumed that the Medicine Hat and Lower Medicine Hat zones would be commingled. No taxes were applied.

9.3 Views of Universal

Universal used the economic studies and reserve estimates from M-P's application, and its views are therefore the same.

9.4 Views of Atlantic Richfield

Atlantic Richfield estimated the Milk River reserves to be 0.50 Bcf per section based upon extrapolation of exponential decline curves for wells in an adjacent area and the Lower Medicine Hat reserves to be 0.348 Bcf per section based upon volumetric calculations.

The evaluations by Atlantic Richfield showed that one well per section is optimum for both the Milk River and Lower Medicine Hat formations. These after-tax evaluations assume initial flow rates of 150 Mcfd and 100 Mcfd for the Milk River and Lower Medicine Hat zones respectively. Atlantic Richfield assumed that there would be no commingling.

9.5 Views of Hudson's Bay

While Hudson's Bay did not submit economic or reserves data, it stated at the hearing that in its estimates, the reserves of the Main Medicine Hat Sand are approximately 1.4 Bcf per section in the unit area nearby.

Hudson's Bay said it did not dispute the economic evaluations of the applicants, but stated that it has more favourable situations in the province in which to invest.

9.6 Views of the Examiners

The examiners do not believe that there has been sufficient production history of the Milk River formation in this area to determine whether the harmonic or the exponential method of production decline analysis is more accurate.

The Board staff performed comprehensive economic calculations using the cost data provided by the applicants and the interveners and with varying assumed reserves. Before-tax present values discounted at 15 per cent were used for comparison.

It was found that the Main Medicine Hat formation provides a higher present worth with two wells per section than with one well per section. This was true over the entire range of reserve figures presented by the applicants and interveners.

Based on segregated production of zones, production of one well per section results in the best economic return in the Lower Medicine Hat zone for each reserve estimate.

The economic evaluations of the Milk River without commingling of production showed that one well per section is best if the lowest estimate of reserves presented at the hearings is correct, while four wells per section yield the highest present value if the highest reserve estimate is accurate. Between these extremes two wells per section is best.

The evaluations were repeated assuming that the Milk River and Lower Medicine Hat zones were commingled in the well bore. With the lowest reserve estimate one commingled well per section yields nearly the same present value as do two commingled wells per section. However, if a larger reserve is assumed, two commingled wells are clearly superior to one. An additional case studied was comprised of four Milk River and two Lower Medicine Hat wells per section with two wells commingled. This case showed a very slight improvement over two commingled wells per section for the greater reserve estimates. However, the incremental present worth attributed to these two additional Milk River wells is negative for reserves lower than those estimated by the applicants. If the Milk River reserves are in the low to middle part of the range studied, approval of 160 acre spacing for the Milk River might well result in offsetting owners suffering a loss through drainage or drilling uneconomic wells in order to prevent drainage. Because of the uncertainty of these reserves and the small additional benefit that would be provided, the examiners do not believe that quarter section spacing should be granted at this time.

10 FINDINGS

10.1 Impact of Reduced Spacing on Equity Between Owners

The two-dimensional areal model study of the Milk River formation performed by the Board staff indicated the effect that close spacing has upon production from an adjacent section with normal spacing. The recovery of a well producing from a 640 acre spacing unit would be reduced by approximately 11 per cent if offset by production from 320 acre spacing units and by approximately 23 per cent if offset by production from 160 acre spacing units.

The examiners believe that the results would be similar for the Medicine Hat and Lower Medicine Hat formations.

10.2 Impact on Target Area Revisions on Equity Between Owners

The examiners believe that approval of the special target areas requested for sections 3, 27 and 33-15-5 W4M would lead to inequitable drainage of the adjacent lands. Approval of the requested targets for section 8-15-5 W4M would not create such inequities because M-P owns the mineral rights in the adjacent section.

The examiners do not believe the off-target penalty relief provided by section 4.060 of the Oil and Gas Conservation Regulations is applicable in these instances due to the blanket nature of the productive sands and the feasibility of overcoming the topographic problems in the area.

10.3 Economic Considerations

Evaluations performed by the Board staff for the area being considered show that the present value of development of the Main Medicine Hat formation on half section spacing would be substantially greater than it would on full section spacing.

The examiners believe it appropriate to consider the production of the Milk River and the Lower Medicine Hat to be commingled for economic evaluation purposes. Under these circumstances two wells per section yield a higher present value than does one. If the reserves are as large as the applicant's estimates, two additional Milk River wells per section will increase the present value slightly. If the Milk River reserves are not this large, approval of 160 acre spacing for the Milk River formation would cause the offsetting owners to suffer drainage or to drill uneconomic wells in order to prevent drainage. It is very difficult to accurately estimate the Milk River reserves volumetrically, and there has not been sufficient production history in the area to accurately determine the reserves by production decline analysis. Consequently, the examiners find that quarter section spacing should not be approved on the basis of current evidence.

10.4 General Findings

The examiners believe that reduced spacing in the areas of application to 320 acre in each of the Milk River, Medicine Hat and Lower Medicine Hat zones should be approved. The examiners are satisfied there will be some improvement in recovery with reduced well spacing and concur with the applicants that it would be reasonable to reduce well spacing to provide capacity to drain the pool at a faster rate. It is also recognized that the proposed spacing units are in a pool, a substantial part of which is being developed with spacing units of the reduced size applied for. The examiners also believe that the economics of drilling a second well in an existing 640 acre spacing unit are sufficiently attractive that it will not impose an economic hardship on the owners in the existing 640 acre spacing area if they believe it is necessary to drill a second well in the spacing unit to prevent leaseline migration of the gas.

11 RECOMMENDATIONS OF EXAMINERS

11.1 Application No. 8487

The examiners recommend the application be approved for sections 8, 9, 21, and 35-15-5 W4M but denied for sections 27 and 33-15-5 W4M and that Order No. SU 848 be amended for this purpose.

11.2 Application No. 8581

The examiners recommend that the application be approved for the Medicine Hat and Lower Medicine Hat formations but that development of Milk River formation be restricted to 320 acre drilling spacing units consisting of the east and the west half-sections with target areas in accordance with Order No. SU 800, and that Order No. SU 848 be amended for this purpose.

11.3 Application No. 8613

The examiners recommend that the application be denied.

11.4 Application No. 8669

The examiners recommend that the application be approved and that Order No. SU 848 be amended for this purpose.

12 DECISION

The Board agrees with the recommendations of the examiners. Amendment of Board Order No. SU 848 is being issued concurrently with this decision.

ENERGY RESOURCES CONSERVATION BOARD

V. Millard
Vice Chairman

DATED October 8, 1975
Calgary, Alberta

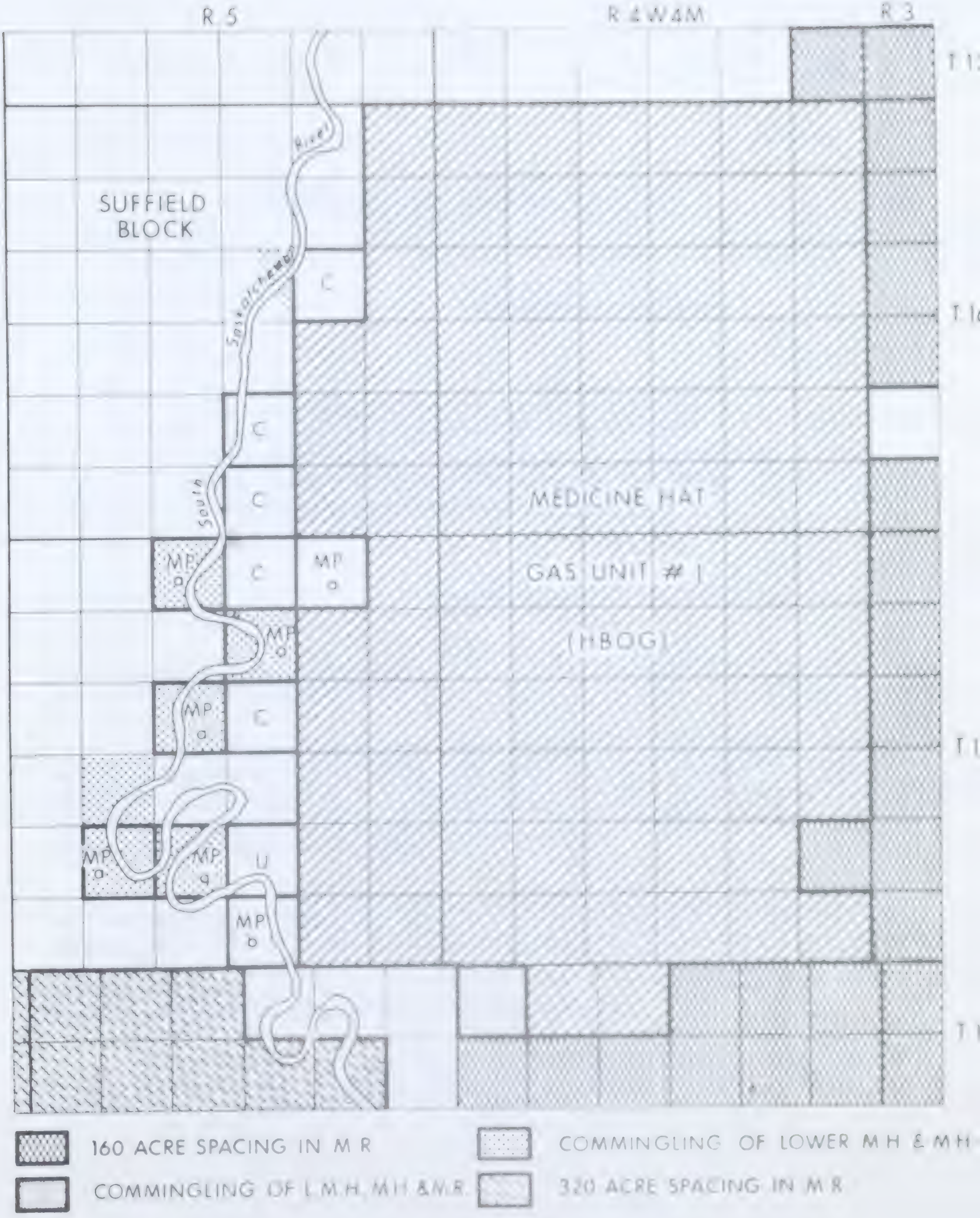

Figure 1 — Spacing Unit Applications - Medicine Hat Area

October, 1975

C	:	Calso Partners	App. No. 8581
MP_a	:	M-P Petroleum Ltd.	App. No. 8487
MP_b	:	M-P Petroleum Ltd.	App. No. 8613
U	:	Universal Gas Co. Ltd.	App. No. 8669

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ENERGY RESOURCES CONSERVATION BOARD

DECISION 75-13
APPLICATION NO. 8597

APPLICATION BY DOME PETROLEUM LIMITED AND AMOCO CANADA PETROLEUM LTD. FOR A PERMIT TO CONSTRUCT AN OIL LINE FOR THE TRANSMISSION OF PROPANE, BUTANES AND PENTANES PLUS FROM THE CANDEL MINNEHIK-BUCK LAKE GAS PLANT.

1. INTRODUCTION

1.1 The Application and Hearing

Dome Petroleum Limited and Amoco Canada Petroleum Company Ltd. applied pursuant to Part 2 of The Pipe Line Act for a permit to construct approximately 12 miles of 3.5-inch oil line for the transmission of propane, butanes and pentanes plus from the CanDel Minnehik-Buck Lake gas plant to their existing Cochrane to Edmonton pipe line.

The hearing opened on August 28, 1975 at 9:00 A.M. with procedural applications by Pembina Pipe Line Ltd. and Goliad Oil & Gas Company for extensions of 180 days and 90 days, respectively, to provide a reasonable time period to submit alternate proposals. Following argument by all parties the Board adjourned the hearing sine die, indicating that a ten day adjournment was considered to be appropriate.

The hearing of this application was reconvened on September 9, 1975 by the Energy Resources Conservation Board with D.R. Craig, P. Eng., V. Millard, and G.J. DeSorcy, P. Eng. sitting.

1.2 Appearances

The following appeared at the hearing.

NOTE: Abbreviations shown in parenthesis are used in this report.

	Represented by	Witnesses
Dome Petroleum Limited and Amoco Canada Petroleum Company Ltd. (Dome-Amoco)	R. C. Muir	D. P. Goodenough, P. Eng. J. R. Crawford, P. Eng. I. D. Thompson J. J. Beddome, P. Eng.
CanDel Oil Ltd. (CanDel)	J. Karberg, P. Eng. R. J. Forgie, P. Eng.	
Goliad Oil & Gas Company (Goliad)	A. Halliwell	C. Albert
Pembina Pipe Line Ltd. (Pembina)	J. C. Major, Q.C.	T. H. France, P. Eng.
M.L.A. for Drayton Valley	R. Zander	
Board Staff	A. L. McLarty E. G. Fox R. Elle	

1.3 Background

Natural gas liquids produced at the CanDel Minnehik-Buck Lake gas plant (CanDel plant) are presently transported via a 3-inch pipe line to a junction approximately 3 miles west of the plant where they are commingled with crude oil in the Pembina gathering system. Pembina has been transporting these natural gas liquids mixed with crude oil to the Edmonton area since 1961 when the CanDel plant came on stream. Since 1971 natural gas liquids mixed with crude oil have been subject to a price penalty which has resulted in less than the full potential revenue being received for these products.

In the spring of 1975 Dome-Amoco negotiated contracts to purchase approximately 90 per cent of the natural gas liquids produced at the CanDel plant subject to the completion of a pipe line to provide transportation of segregated natural gas liquids. On April 24, 1975, Dome-Amoco submitted an application to construct a pipe line which would connect the CanDel plant to the Cochrane to Edmonton natural gas liquids line owned by Dome-Amoco and provide transportation of the CanDel plant fluids to the Edmonton area.

Pembina not only opposed Dome-Amoco's application but advised that it would propose alternate facilities. Pembina stated that its proposal would require the construction of approximately 10 miles of new pipe line to separately transport the natural gas liquids to Goliad's gathering system. They would then be transported to the Goliad fractionating plant near Drayton Valley. Pembina proposed that Goliad would extract the liquifiable petroleum gases at its fractionating plant and transport the pentanes plus component of the CanDel plant product through an existing pipe line back to Pembina's main tank farm for delivery to the Edmonton area in segregated batches.

Pembina's application for a permit to construct its proposed alternate pipe line facilities was received by the Board on September 8, 1975.

2. DEFINITION OF ISSUES

The Board considers the issues of this application to be

1. the need for additional pipe line facilities
2. the suitability of the proposed pipe line in relation to the need and to alternate schemes
3. the relative environmental impact due to the construction of the proposed pipe line or the alternate pipe line.

3. THE NEED FOR ADDITIONAL PIPE LINE FACILITIES

3.1 Views of the Applicant

Dome-Amoco stated that the proposed pipe line would provide for the shipment of segregated natural gas liquids which is not possible with existing facilities. The ability to transport the liquids in segregated form, as opposed to commingling with the crude oil stream, would enable Dome-Amoco to purchase the liquids at a price of 7.629 dollars per barrel or approximately 51.5 cents per barrel more than the existing price of 7.115 dollars per barrel. Dome-Amoco contended that the pipe line is therefore needed to provide the owners and the Province the full value of the natural gas liquids produced at the CanDel plant. Dome-Amoco stated that it has a contract to purchase approximately 90 per cent of the natural gas liquids from the CanDel plant subject to the completion of the pipe line by November 2, 1975.

3.2 Views of CanDel Oil Ltd.

CanDel stated that the plant owners wished to obtain the highest possible returns for the natural gas liquids produced at their plant and such was not possible with existing facilities. In supporting the Dome-Amoco application, CanDel contended that the new facilities are urgently needed since each day of operating on the basis of existing facilities results in a loss in revenue of some $500.00.

3.3 Views of Goliad Oil & Gas Company

Goliad did not comment directly on the need for additional pipe line facilities but in view of its support of the Pembina proposal for alternate new facilities, the Board assumes that Goliad agrees that additional facilities are needed.

3.4 Views of R. Zander (M.L.A. - Drayton Valley)

Mr. Zander presented the view that since the plant products were moving through existing facilities which have adequate capacity there is no need for any additional pipe lines. Mr. Zander added that he had been unsuccessful in obtaining information from the companies involved concerning the need for additional facilities.

3.5 Views of Pembina Pipe Line Ltd.

Although it did not make explicit comment on the need for segregated shipment. Pembina did propose alternate facilities to accomplish essentially the same objective proposed by Dome-Amoco, and the Board concludes that Pembina accepts the need for additional facilities.

3.6 Views of the Board

The Board accepts the view expressed by the applicant and others that the existing pipe lines are not suitable to transport the natural gas liquids in a segregated form. As a consequence the product owners are receiving at least 51.5 cents per barrel less than would be possible with additional pipe line facilities. In addition to the possible increase in revenue to the producers, the Province would also benefit from higher royalties if these natural gas liquids were sold as a segregated product for full market value. Having regard for the evidence, the Board believes the additional facilities are needed and considering that the owners and the Province are not receiving full value for the natural gas liquids the Board agrees that the need for new facilities is urgent and should not be unnecessarily delayed.

4. THE SUITABILITY OF THE PROPOSED PIPE LINE IN RELATION TO THE NEED AND TO ALTERNATE SCHEMES

4.1 Views of the Applicant

Dome-Amoco stated that in the spring of 1975 it negotiated and signed a contract to purchase approximately 90 per cent of the natural gas liquids produced at the CanDel plant. Dome-Amoco said that the contract is for a period of approximately five years but would not continue to be in effect unless the proposed pipe line facilities are completed by Dome-Amoco by November 2, 1975, to allow for the shipment of natural gas liquids to its Cochrane to Edmonton pipe line as a segregated stream. Dome-Amoco stated that its initial application was submitted to the Board on April 24, 1975 and that it has been prepared to commence construction of the proposed pipe line since June 25, 1975.

Dome-Amoco presented some evidence to illustrate that the total production in Alberta of natural gas liquids in the form of both fractionated product and mixes greatly exceeds the existing Provincial requirements. Dome-Amoco was of the view that this surplus would be sufficient to allow for possible future increases in Alberta uses and still allow the excess to be transported to Eastern Canada and U.S. markets. The fractionated or specification product normally would be transported by tank car and small product pipe lines and the pentanes plus normally would be transported by Interprovincial pipe lines to points outside of Alberta and Canada.

Dome-Amoco stated that the rail transportation cost to ship specification product to Eastern Canada exceeds the pipe line transportation cost and that this difference is likely to increase due to the relatively high labour costs associated with rail transport. Since the fractionating costs are small compared to the transportation costs to Eastern Canada Dome-Amoco contends it is in the interest of the Province to ship the natural gas liquids, including the natural gas liquids from the CanDel plant, by pipe line so that the highest possible value for its resources can be obtained. Dome-Amoco expressed the view that fractionating in the Province was desirable to the extent that Alberta markets can be most economically served.

Dome-Amoco expressed the view that a surplus of natural gas liquids has resulted in a variety of marketing methods that have been determined by free market competition. Dome-Amoco further expressed the view that its method of marketing and transportation was viable and in the interest of the Province and suggested that free market competition should be allowed to prevail.

4.2 Views of CanDel Oil Ltd.

CanDel indicated that Dome-Amoco had executed contracts to purchase some 90 per cent of the natural gas liquid produced at the CanDel plant, and there was little value in considering alternate proposals while it was bound by existing contractual obligations. CanDel further expressed concern that alternate proposals to date had presented no distinct advantage and additional study would only lead to further delay and loss to the producers. CanDel stated that evidence at the hearing indicated that the Goliad plant may become obsolete or redundant. CanDel stated it therefore did not want to be forced to commit its product to the Goliad plant because it was doubtful that such would be in the best interest of the CanDel plant owners.

4.3 Views of Goliad Oil & Gas Company

Goliad expressed the view that Dome-Amoco's proposed pipe line was not in the public interest in that it would result in Goliad's existing local facilities becoming obsolete sooner than would be the case should the subject liquids be made available to Goliad's fractionating plant. Goliad stated that it was prepared to pay a price of 8.01 dollars per barrel for pentanes plus and a liquid petroleum gas price of 3.25 dollars per barrel, f.o.b. the CanDel plant, subject to approval of the alternate pipe line proposal of Pembina.

4.4 Views of R. Zander (M.L.A. - Drayton Valley)

Mr. Zander expressed concern regarding public interest aspects of the application. In particular he contended that since the local fractionating facilities had adequate capacity to process the natural gas liquids from the CanDel plant that these products should be made available to that plant. Mr. Zander expressed concern regarding the potential loss of jobs in the Drayton Valley area should the Dome application be approved and the unrefined condensate removed from the area.

4.5 Views of Pembina Pipe Line Ltd.

Pembina contended that the Dome application should be denied because it was not in the public interest. Pembina cited duplication of facilities, availability of the product for Alberta uses and inadequate conservation as the basis for its submission. Pembina, on the other hand, submitted that its alternate pipe line proposal was in the public interest because it would utilize existing facilities, would make the product available to Alberta consumers, would require about 2.5 miles less pipe line construction and construction would be on an existing right of way whereas the Dome proposal involved the acquisition and use of a new right of way.

4.6 Views of the Board

In the Board's view either the Dome-Amoco or the Pembina proposal could fit into a rational marketing plan and the Board believes that costs would be more or less equal. The alternate proposal might involve slightly less new pipe line but, because it is more advanced, the Dome-Amoco proposal would likely result in increased revenue to the producers and the Province than would the alternate scheme. In this connection the price Goliad stated it was initially prepared to pay, 8.01 dollars per barrel of pentanes plus and 5.25 dollars per barrel for liquid petroleum gases resulting in a weighted price for the product stream of 7.684 dollars per barrel, compares closely with the Dome-Amoco price of 7.629 said by Dome-Amoco to be in the process of upward negotiation. It is therefore the Board view that with respect to suitability of the proposed Dome-Amoco facility and the Pembina alternate there is little significant difference.

With respect to the concerns raised by Mr. Zander of the possible idling of Goliad facilities, there is the question, touched on by CanDel, of whether it would be prudent and in the public interest for the CanDel plant products to be committed to the Pembina-Goliad system if the remaining life of the Goliad facilities is limited. On this account the Board does not consider the possible earlier idling of the Goliad facilities would be reason for refusing the Dome-Amoco proposal. The Board notes that the small amount of liquid product from the CanDel plant would not significantly effect the turn-down time for the Goliad plant.

5. THE RELATIVE ENVIRONMENTAL IMPACT DUE TO THE CONSTRUCTION OF THE PROPOSED PIPE LINE OR THE ALTERNATE PIPE LINE

5.1 Views of the Applicant

Dome-Amoco filed as part of its application an Environmental Consultants report concerning the impact of each of the proposed pipe lines. Dome-Amoco relied on those reports to indicate that neither pipe line would have any major effect on the environment. In particular, the reports indicate that although there would be three stream crossings along the route proposed by Dome-Amoco and only one along the alternate route, all of these would be very small and could be crossed with a minimal impact. This impact, it was submitted, would be further minimized by constructing the pipe line during late fall or early winter.

5.2 Views of CanDel Oil Ltd.

CanDel did not express any view concerning the environmental impact of the construction of either pipe line.

5.3 Views of Goliad Oil & Gas Company

Goliad did not express any view concerning the environmental impact of the construction of either pipe line.

5.4 Views of R. Zander (M.L.A. - Drayton Valley)

Mr. Zander presented the view that any pipe line construction was detrimental and should not be allowed unless it was clearly necessary. Mr. Zander said that if a pipe line was installed the environmental impact along an existing right of way would be acceptable to the agricultural community but construction along a new route would be something it could not accept. Mr. Zander stated that, although all the farmers along the Dome-Amoco proposed pipe line route had given easements, the most serious problem occurs when the pipe line is in place and compensation for surface damage is required.

5.5 Views of Pembina Pipe Line Ltd.

Pembina expressed the view that since its proposal was some 2.5 miles shorter and along an existing right of way the environmental impact would be somewhat less than for the Dome-Amoco proposed pipe line. In addition Pembina suggested that it had an advantage in that it had in the past dealt with the people along the existing right of way without having problems and would expect that further arrangements with the landowners would be a little smoother than would be possible in a new area. Pembina also expressed the view that, since its proposed pipe line would cross only one stream and the Dome-Amoco proposal would cross three streams, the environmental impact would be reduced if its proposal were approved.

5.6 Views of the Board

The Board accepts evidence presented by Dome-Amoco and others that the environmental impact of the proposed pipe line would be minimal. While Pembina's alternate proposal is approximately 2.5 miles shorter and involves only one stream crossing, the Board is of the view that the overall environmental impact would not be much different for the two lines, and in particular, would not be of such significance as to warrant refusal of the Dome-Amoco application.

The Board recognizes Mr. Zander's concern for the well-being of the landowner's involved along the proposed pipe line route. Although the matter of compensation for surface damage is not within the Board's jurisdiction, it is of the opinion that the problems associated with compensation for surface damage would be more or less equal between the Dome-Amoco and the Pembina proposed routes. The Board notes that all landowners along the Dome-Amoco route appear to have agreed with the proposal as evidenced by the easements which they have signed.

6. FINDINGS

The Board agrees with the applicant and others that there is a need for additional facilities. With respect to the suitability of the proposed Dome-Amoco facilities relative to the alternate scheme proposed by Pembina the Board sees little significant difference. The Board also believes that the Dome-Amoco and Pembina proposals would have similar environmental impact. For these reasons, the Board does not believe it should delay or defer its decision on the Dome-Amoco application until the Pembina application has been fully considered. Granting the Dome-Amoco application would not preclude the possibility of also granting the application by Pembina. In the Board's view, when competing applications each meet a need and the Board is not satisfied that one application is clearly in the public interest compared to others, then more than one approval may be granted. In such an event, the Board expects that normal business practices, or possibly even conditions to the approvals, would dictate that only one facility would ultimately be constructed.

7. DECISION

The Board grants the application by Dome-Amoco for a permit to construct a 12.2 mile pipe line to carry natural gas liquids from the Minnehik-Buck Lake gas plant to the Cochrane to Edmonton pipe line operated by Dome-Amoco. The permit issued will carry a condition that the construction of the pipe line shall be substantially completed by January, 1976. This decision does not preclude the approval of an alternate scheme should one be shown to be suitable and in the public interest.

ENERGY RESOURCES CONSERVATION BOARD

D R Craig

D.R. Craig
Vice Chairman

October 23, 1975

ENERGY RESOURCES CONSERVATION BOARD

Decision 75-14
Application No. 8547

RATEABLE TAKE OF GAS FROM THE RICINUS D-3 A POOL AND DECLARATION OF THE GATHERING LINE FROM THE RICINUS D-3 A POOL TO THE RAM RIVER GAS PLANT AND THE FUEL GAS LINE FROM THE RICINUS GAS PLANT TO THE RICINUS D-3 A POOL AS COMMON CARRIERS

1 INTRODUCTION

1.1 The Application and Hearing

Mobil Oil Canada, Ltd., on behalf of itself, Chevron Standard Limited and Gulf Oil Canada Limited, applied

1. pursuant to section 35 of The Oil and Gas Conservation Act, for an order to distribute gas production from the Ricinus D-3 A Pool (hereinafter referred to as the pool) equally among the wells in the pool, and
2. pursuant to section 49 of the Act, for a declaration that the proprietor of the gathering line from the pool to the Aquitaine Ram River Gas Processing Plant and the fuel gas line from the Amoco Ricinus Gas Processing Plant to the pool be common carriers.

Mobil stated that it would not wish the denial of one of the applications to cause the denial of the other.

Interventions to the application were filed by Pacific Petroleums Ltd., Chevron Standard Limited, Consolidated Natural Gas Limited and Gulf Oil Canada Limited. The latter three intervened for the purposes of cross-examination and argument.

The application was heard by the Board in Calgary, Alberta on 17 July 1975 with D.R.Craig, P.Eng., G.J.DeSorcy, P.Eng. and V.E.Bohme, P.Eng. sitting.

1.2 Appearances

The following appeared at the hearing:

	Represented by	Witnesses
Mobil Oil Canada, Ltd. (Mobil)*	D.W.MacFarlane	J.R.Mutch, P.Eng. M.A.Burns, P.Eng. A.M.DeGreeve, P.Eng. D.E.Gavelin, P.Geol.
Pacific Petroleums Ltd. (Pacific)*	J.L.Snith	E.L.Molnar, P.Eng. S.B.Smith H.G.Redgade R.H.Paul, P.Geol.
Chevron Standard Limited (Chevron)*	R.R.Mahaffey	
Consolidated Natural Gas Limited (Consolidated)*	G.Morgan, P.Eng.	
Gulf Oil Canada Limited (Gulf)*	L.J.Hudon	
Board Staff	A.L.McLarty R.L.Archibald, P.Eng.	

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* Abbreviation used in this report.

1.3 Background

The Ricinus D-3 A Pool is a large non-associated sour gas pool. It was discovered in 1968 with the drilling by Amoco Canada Petroleum Company Limited (hereinafter referred to as Amoco) and Pacific of the well Pacific PanAm Ricinus 7-19-35-8. The pool was further delineated in early 1970 when Mobil, Chevron and Gulf drilled a second D-3 well, Mobil et al Ricinus 11-17-35-8. A third well, Pacific Amoco Ricinus 12-6-35-8, was drilled and completed by Pacific and Amoco in the southern part of the same reef structure during 1971.

During the period 1971 to 1973 each of the working interest owners negotiated separate gas sales contracts with various gas purchasers.

During late 1973 and 1974 both Pacific and Mobil investigated alternatives for production of the pool. Each company arrived at the conclusion that it was not desirable from either an economic or environmental standpoint to construct a separate plant to process the gas. At this point Pacific commenced discussions with Aquitaine Company of Canada Ltd. (Aquitaine), operator of the Ram River Gas Plant located in section 2-37-10 W4, to explore the possibility of having the gas processed in that plant. On 20 September 1974, by letter of agreement among Aquitaine, Pacific and Amoco, Aquitaine indicated its intent to make 40 million cubic feet per day (MMCFD) of raw gas processing capacity available to the pool owners. A copy of the formal agreement to this arrangement was introduced as evidence at the hearing. It was dated 6 June 1975. The agreement provided for the processing of gas produced from the pool by owners not a party to the agreement upon unitization of the pool.

During the period 21 October 1974 to 21 March 1975 there were several meetings of the working interest owners in the pool to discuss unitization. In addition, technical representatives of the various companies met in an attempt to resolve differences in interpretation of the reef outline. The parties were not able to reach an agreement on the equity parameters to be used for unitization.

During the period January to March 1975, Pacific installed production facilities at the 7-19 well site, an 8-inch sour gas flow line from the well to the Aquitaine Ram River Gas Plant and a 2-inch fuel gas line from the Amoco Ricinus Gas Plant to its well. The latter plant processes sweet gas from a Cardium oil pool.

On 5 June 1975 Pacific commenced production of the 7-19 well at rates of 18 to 28 MMCFD. At the time of the hearing, the Pacific well in 12-6 and the Mobil well in 11-17 remained unconnected and shut-in. Refer to Attachment 1 for pool outline, well, plant and pipe line locations.

1.4 Provisions of the Legislation and Basis of Consideration

1.41 Application for Rateable Take of Gas

Section 35 of the Oil and Gas Conservation Act reads

> "The Board, after a public hearing, may, by order, restrict the amount of gas and oil produced in association with gas that may be produced during a period defined in the order from a pool within Alberta
>
> (a) by limiting, if such limitation appears necessary, the total amount of gas that may be produced from the pool, having regard to the efficient use of gas for the production of oil, and to the demand for gas from the pool, and
>
> (b) by distributing the amount of gas that may be produced from the pool in an equitable manner among the wells in the pool, for the purpose of giving each well owner the opportunity of producing or receiving his share of the gas in the pool."

Before approving an application under section 35, the Board believes that it must be convinced that an owner has been and is being deprived of the opportunity of obtaining his just and equitable share of the production of any pool. The Board considers that a proper basis of assessment is to determine whether or not each owner has and will continue to have a reasonable opportunity to produce gas at rates more or less in proportion to his recoverable reserves.

In addition, the Board believes that a rateable take order should have a neutral effect on unit negotiations. As a result, the Board would not be prepared to issue a rateable take order where a unit was being considered unless the Board was satisfied that every effort to achieve unitization had been exhausted.

1.42 Application for Declaration of a Common Carrier

Section 49 of The Oil and Gas Conservation Act reads in part

> "(1) Upon application and after a hearing, the Board, with the approval of the Lieutenant Governor in Council, may from time to time declare each proprietor of a pipe line in any designated part of Alberta or the proprietor of any designated pipe line to be a common carrier as and from a date fixed by the order for that purpose, and thereupon any such proprietor is a common carrier of oil, gas or synthetic crude oil or any two or all of them in

accordance with the declaration."

The Board believes that before approving an application under section 49 for a common carrier it should be demonstrated that:

(1) Oil, gas or synthetic crude oil is available for transportation through an existing pipe line.

(2) There is reasonable expectation of a market for the substance which is proposed to be transported by the common carrier operation.

(3) The applicant could not make reasonable arrangements to use an existing pipe line.

(4) The proposed common carrier operation is either the only economically feasible way to transport the substance in question or is clearly the most practical way or is clearly superior environmentally.

2 RATEABLE TAKE OF GAS

2.1 Views of Mobil

Mobil made its application for rateable take of gas for the reason that it had failed after some five months of negotiation to achieve a unitization agreement with other working interest owners of the pool. Mobil said that upon unitization, processing capacity and transportation to the Aquitaine Plant would have been made available to Mobil and its partners. Failing unitization, it could not share in the 40 MMCFD of processing capacity proposed to be made available to future unit participants. Mobil stated that Pacific and Amoco had negotiated for the available capacity at the Aquitaine Plant and installed a pipe line to satisfy it. Mobil contended it could not obtain access to these facilities on reasonable terms. After reviewing the available alternatives, Mobil considered a rateable take order was necessary to prevent serious drainage.

Mobil proposed that the rateable take order be based upon procedures similar to those adopted by the Board for the allocation of oil production to market demand. Mobil suggested that it would be appropriate if gas production were restricted to the available processing capacity in the same manner that oil production is limited to the available market.

Mobil proposed that gas production be initially divided equally among the wells in the pool consistent with Mobil's interpretation of the reserves in the pool as discussed later in this section. Mobil stated that under this sytem there would be no allegations of forced unitization and no opportunity for one party to impose its unitization terms on another.

With respect to alternatives to a rateable take order, Mobil stated that it had reviewed the possibility of constructing a separate plant to process gas from the pool and concluded that it could not be economically or environmentally justified. Mobil estimated the cost of such a sour gas processing plant and a railway connection would be in excess of 20 million dollars. In addition, a small plant would have a lower sulphur recovery efficiency and would therefore be environmentally undesirable. Mobil consulted Gulf Oil Canada Limited, operator of the Strachan Gas Processing Plant located some 15 miles from the pool, regarding possible available capacity. Gulf indicated that it did not have spare capacity and that, in any event, the dry Ricinus gas would be unsuitable for processing in its plant. Upon review of these alternatives, Mobil decided to wait until processing capacity became available at the Aquitaine Plant. Mobil stated that it did not attempt to become a participant in the negotiations between Aquitaine and Pacific because Pacific had indicated it would make this capacity available to the owners of the pool.

Mobil's interpretation of the size of the pool was based on seismic information and on data from the Pacific PanAm Ricinus 7-19-35-8 and Mobil et al Ricinus 11-17-35-8 wells. Mobil excluded the well Pacific Amoco Ricinus 12-6-35-8 from its analysis because it held the view that the gas zone in this well was effectively separated from the other two wells by a topographic low in the reef as indicated by Mobil's interpretation of its seismic data. Mobil estimated the initial gas in place in the pool to be 268 billion cubic feet and stated that, because of uncertainties respecting aquifer behaviour, residual gas saturations and the effect of coning, the recovery factor would likely be between 56 per cent, assuming a fully effective water drive, and 91 per cent, assuming volumetric depletion. Mobil mapped a large aquifer of approximately 45 square miles based on seismic information and data from six wells that penetrated the Leduc reef. Mobil's estimates of reservoir factors and gas reserves are presented in Attachment 2.

Mobil indicated that 51.6 per cent of the pool's in-place gas reserves is under Pacific-Amoco lands and the remaining 48.4 per cent is under lands of Mobil et al. Mobil stated that, under full pressure maintenance and because of the higher structural location of its well, it could recover up to 56 per cent of the recoverable gas. Mobil stated that, having regard for the uncertainties involved, its analysis of reserves and potential recovery supported its contention that production should be equally divided between the two wells.

In supplementary information provided after the hearing, Mobil estimated that if Pacific continued to produce its well at a rate of 10 billion cubic feet per year Mobil would suffer a drainage loss of 4.9 billion cubic feet per year. This was based on Mobil's position that gas reserves under Mobil's lands represent 49 per cent of the gas in place.

2.2 Views of Pacific

Pacific stated that, although attempts to unitize the pool had failed, all attempts to reach a mutually satisfactory agreement between itself and Mobil had not been exhausted at the time the application for rateable take was filed. Pacific said that a rateable take order would in effect be an establishment of an artificial unit participation. In addition, Pacific contended that each owner in the pool has a reasonable opportunity to produce his share of the gas in the pool by means of either competitive or unitized operations. Pacific stated that the installation of the gathering system and fuel supply line and the negotiations between itself and Aquitaine to process gas were on its own behalf, for its own benefit. However, Pacific indicated to the other owners that it was prepared to unitize in order to share the available plant capacity and pipe lines with them. Pacific gave evidence of this by referring to a clause in the processing agreement which provided a share of the available processing capacity to other owners in the event of unitization.

Pacific agreed with Mobil that it would not be economically feasible to build a separate plant to process gas from the pool. As alternatives, Pacific suggested that Mobil has the same opportunity as Pacific had to negotiate with Aquitaine for processing capacity at the Aquitaine Plant and that the Strachan Plant might offer a second choice, although Pacific conceded that it was unlikely this plant had any spare processing capacity.

Pacific stated that it had been forced to commence competitive operations because unitization parameters could not be agreed to and because of Mobil's unwillingness to accept any but its initial position on unitization.

Pacific estimated the gas in place in the pool to be some 443 Bcf, and the reservoir recovery to be 85 per cent (see Attachment 2). Of the gas in place, some 110 Bcf was attributable to Pacific's extension of the reef outline to include the 12-6 well. Pacific stated that, in its opinion, there is reservoir continuity between the north and south areas of the reef underlying a saddle Pacific has mapped in section 18. This conclusion was based on seismic information and was supported, although not confirmed, by interface measurements, pressure data and gas analysis. Pacific said that no saddle exists which would effectively separate the pool into two hydrocarbon accumulations. In addition, Pacific submitted that its seismic data and regional subsurface studies did not in any way indicate the presence of the massive aquifer which Mobil reported. Pacific estimated the areal extent of the underlying Leduc Reef aquifer to be about 20 sections.

Pacific stated that its group owned about 73 per cent and Mobil's group about 27 per cent of the gas in place in the pool. Based on the north area only, which more closely conforms with Mobil's interpretation of the areal extent of the reef, Pacific indicated its group controlled 65 per cent and Mobil's group 35 per cent of the in place gas reserves.

Pacific said that a scarcity of well bore data and the interpretive nature of the geological and geophysical evidence makes a rigorous analysis of the equity parameters difficult and stated that a conciliatory approach is essential. Pacific stated that, should a rateable take order be issued, the production rates to be specified therein should be based on the principle of preservation of equity and the basis of equity is ownership of reserves. In addition, it stated that the Board should consider the same parameters that would be considered in unit negotiations.

2.3 Views of the Board

In considering the application the Board decided to address itself first to the question of whether or not an order regulating production is necessary and only if it found in the affirmative on this question to concern itself with the appropriateness of the type of order suggested by the applicant.

The Board believes that the application for rateable take of gas was premature in the sense that no production had been taken from the pool at the time the application was made. Although the Pacific well had been placed on production prior to the hearing of this application, the Board is of the opinion that no perceptible drainage of Mobil's reserves had occurred. If production from the Pacific well continues at current rates, and if Mobil is unable to gain access to the Aquitaine Plant or some other processing facility, and thus produce its reserves, drainage would likely occur.

After examining the various alternatives, the Board concludes that the Aquitaine Plant would provide the most economic and practical means to process Mobil's gas. Although Pacific indicated that it has contracted for all of the capacity available to process pool gas, the Board believes that, in light of its decision to grant the common carrier application (as discussed in the next section of this report), the two parties may be able to arrange the details of processing all gas produced from the pool. Should this not be the case, the Board believes a common processor application could be advanced.

The Board believes that after a five-month period of unit negotiations, which consisted of three unitization meetings and two technical meetings, all avenues to reach a mutually satisfactory agreement may not have been exhausted. The Board believes that the matters preventing the parties involved from reaching a voluntary agreement on the unitization parameters are the failure to agree upon the interpretations of the available seismic information and the anticipated performance of the underlying aquifer. Having regard for these outstanding differences the Board concludes that it would be unlikely that an early agreement could be reached between the parties. Notwithstanding, the Board is reluctant to issue a rateable take order in this case because it would influence and possibly prevent future unitization of the pool. However, if Mobil is not able to arrange for processing of its gas even with the common carrier declaration, or if the arrangements are such that Mobil can satisfy the Board that it is unable to obtain its share of production from the pool, the Board would find it necessary to reconsider the need for a rateable take order to prevent inequitable drainage of Mobil's gas reserves.

2.4 Decision on the Rateable Take Application

The Board considers that disposition of the subject application for rateable take of gas from the Ricinus D-3 A Pool may not be necessary in light of the Board decision to seek the approval of the Lieutenant Governor in Council to issue a common carrier order. Accordingly, the Board defers its decision on the application and requests that Mobil advise it by 31 January 1976 whether or not it has been able to make satisfactory arrangements for the processing of its gas. In the event that Mobil advises the Board in the affirmative the application for rateable take will be dismissed. In the alternative, the Board would reconsider the need for a rateable take order. Also, the Board would be prepared in such circumstance to consider an application requesting that the Aquitaine Ram River Gas Processing Plant be declared a common processor.

3 COMMON CARRIER

3.1 Views of Mobil

Respecting the matter of a market for its gas, Mobil indicated in supplementary information provided after the hearing that it has contracted with Consolidated to sell gas produced from the pool at an average daily contract rate of 5.5 MMCFD. This does not include Gulf or Chevron's share of the production since they negotiated separate gas sales contracts.

Mobil stated that Pacific, as proprietor of an 8-inch gas gathering line from the well PanAm Ricinus 7-19-35-8 to the Aquitaine Plant and a 2-inch fuel gas line from the Ricinus Plant to the 7-19 well, had indicated in unit negotiations that the lines would be shared among the owners of the proposed unit. Mobil stated further that, when it was apparent that the unitization parameters could not be agreed to, it had by letter to Pacific dated 21 April 1975 asked for one-half of the pipe line capacity. Mobil said that Pacific did not reply to the letter.

Mobil said that it had given serious consideration to constructing its own gathering line from the pool to the Aquitaine Plant but found no justification for paralleling Pacific's existing line. Mobil contended that Pacific's line had sufficient capacity, 40 to 50 MMCFD, to meet the available processing capacity and that it was more than adequate to produce the pool reserves at an economic rate. Mobil indicated that Pacific's 2-inch fuel line from the Ricinus Plant was required to provide gas for well site heaters and the pilot flames on flare stacks. Mobil said that it assumed it would have fuel gas available to it since it is a part owner of the Ricinus Plant.

Mobil estimated the cost of constructing a separate 8-inch gathering line and 2-inch fuel line to be about 2 million dollars. Mobil said that it would be economically feasible to install the necessary pipe lines but that it would be economic waste and not required in view of the fact that the existing lines would be adequate to accommodate all of the gas that the Aquitaine plant could handle for a lengthy period into the future.

3.2 Views of Pacific

Pacific indicated that Amoco and itself had contracted their reserves with TransCanada at an average raw gas rate of about 46 MMCFD. Pacific stated that this commitment would be met by producing the 7-19 well and by tying-in the 12-6 well and/or drilling an additional development well if necessary. This would utilize the entire capacity of the line which Pacific estimated to be about 40 MMCFD at an operating pressure of 1,275 psig. In the event that the pool was unitized, this capacity would be shared with the Mobil 11-17 well.

Pacific stated that declaration of the 8-inch gathering line as a common carrier would deny Pacific the right and ability to produce and deliver its equitable share of the gas reserves. Pacific submitted that it would be appropriate and justifiable for Mobil to construct and install a flowline to suit its own particular requirements.

Pacific stated that the fuel supply line was not subject to the common carrier provision of the Act because Mobil had no product to transport through the line. Pacific agreed that an alternative for Mobil might be to purchase gas from Pacific in which case a common carrier designation of the fuel line would not be necessary.

3.3 Views of the Board

The Board is satisfied that, while Mobil does not now have access to the Aquitaine Plant, it does have raw gas available for transportation through Pacific's 8-inch gas gathering line and a market for that gas. Also the Board accepts that Mobil is the owner of gas produced at the Ricinus gas plant and would have a use for it in its pool operations.

The Board does not believe that the owners of the pool have made a specific effort to make reasonable arrangements to use the existing pipe lines. This does not seem illogical given the state of the unit negotiations among the pool owners and recognizing that inherent in the negotiations was the understanding that these facilities would be made available to all parties when unitization was achieved. Thus, even though there was no evidence presented at the hearing clearly showing that reasonable arrangements for use of the existing pipe lines could not be achieved, the Board would not deny the application for this reason alone.

The Board recognizes that Pacific's average day contract rate is in excess of the available pipe line capacity. It also recognizes that there is limited processing capacity available for gas produced from the pool and that any alternatives to obtain processing capacity are unjustified or far less desirable. Since the processing capacity is equivalent to the capacity of the 8-inch gathering line, the Board does not accept Pacific's argument that a common carrier designation would deny Pacific the right to produce its equitable share of reserves.

The Board concludes that the 8-inch gathering line has sufficient capacity to transport gas at rates equal to the available processing capacity and that it is clearly the most economical and practical way to transport all gas produced from the pool. The Board also concludes that the existing 2-inch fuel line is clearly the practical way to serve all the fuel gas needs of production operations in the Ricinus D-3 A Pool. However, the Board is hopeful that a common carrier designation for the fuel line will not be necessary in light of its decision respecting the 8-inch gathering line. Should Mobil not be able to gain access to the fuel line, the Board would be prepared to seek the approval of the Lieutenant Governor in Council to issue a common carrier order for this pipe line as well.

3.4 Decision

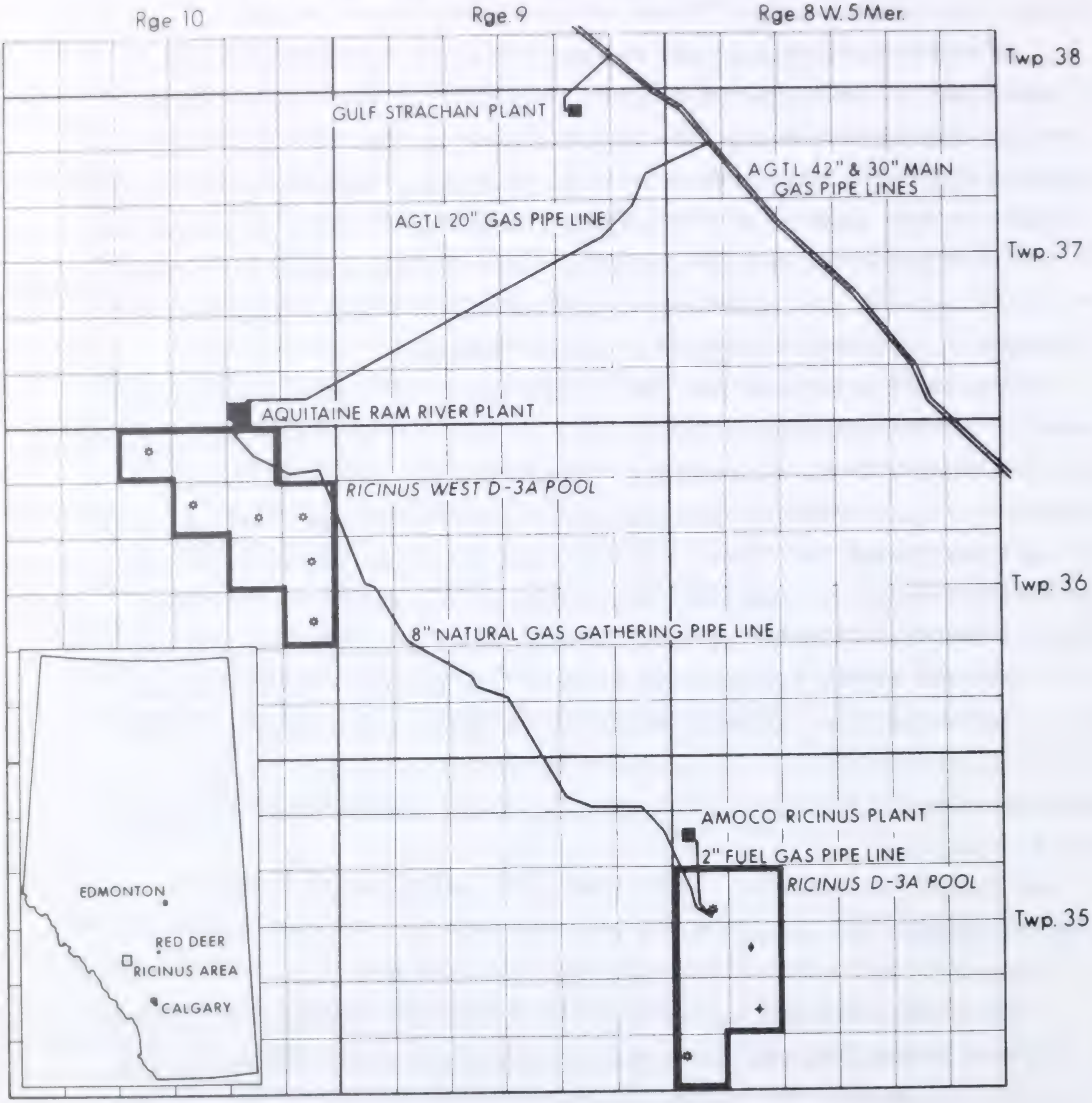
The Board, with the approval of the Lieutenant Governor in Council, is prepared to issue a common carrier order for the 8-inch gathering line. Further, if necessary, the Board is prepared to seek the approval of the Lieutenant Governor in Council for a similar order respecting the 2-inch fuel gas line should Mobil advise by 31 January 1976 that it has been unable to negotiate access to this line.

ENERGY RESOURCES CONSERVATION BOARD

D.R.Craig
Vice Chairman

DATED 14 November 1975
Calgary, Alberta

ATTACHMENT 1 TO DECISION 75-14



RICINUS AREA

ADAPTED FROM FIGURE 6 OF APPLICATION NO. 8547
BY MOBIL OIL CANADA, LTD.

ATTACHMENT 2 TO DECISION 75-14

Comparison of Reservoir Parameters and Reserves
Ricinus D-3 A Pool

	Mobil	Pacific
Rock Volume (Acre Feet)	295,875	448,275
Porosity	.077	.080
Water Saturation	.132	.080
Initial Pressure (Psia)	5,855	5,855
Temperature (^oF)	224	224
Compressibility Factor	.98	.98
Gas in Place (Bcf)	268	443
Recovery (%)	56 to 91	85

ENERGY RESOURCES CONSERVATION BOARD

DECISION 75-15
APPLICATION NO. 8845

APPLICATION BY IMPERIAL OIL LIMITED FOR A LICENCE TO DRILL A WELL TO BE LOCATED IN LEGAL SUBDIVISION 4 OF SECTION 4, TOWNSHIP 21, RANGE 4, WEST OF THE 5TH MERIDIAN FOR THE PURPOSE OF OBTAINING AND PRODUCING GAS FROM THE RUNDLE FORMATION.

1 INTRODUCTION

1.1 The Application and Hearing

Imperial Oil Limited applied pursuant to the provisions of The Oil and Gas Conservation Act and Regulations thereunder for a licence to drill a well to be located in Legal Subdivision 4 of Section 4, Township 21, Range 4, West of the 5th Meridian for the purpose of obtaining and producing gas from the Rundle Formation.

The application was heard by the Board at Calgary, Alberta on November 10, 1975, with D.R. Craig, P.Eng., V. Millard and G.J. DeSorcy, P.Eng., sitting.

Interventions to the application were received from Three Point Creek Ranching Co. Ltd., Inland Research Ltd., and Miss Z. Hanen. Mrs. B. McKenney did not file an intervention but appeared at the hearing and was permitted to cross-examine the applicant and comment upon the application.

Miss Z. Hanen was not represented at the hearing.

1.2 Appearances

The following appeared at the hearing.

NOTE: Abbreviation used in report*

	Represented by	Witnesses
Imperial Oil Limited (Imperial)*	D. O. Sabey, Q.C.	D. J. McEachern, P. Eng. V. G. Johnson, P. Eng. D. Jardine, P. Eng.
Three Point Creek Ranching Co. Ltd. (Three Point Creek Ranching)*	G. R. Forsythe, Q.C.	J. M. Ballachey
Inland Research Ltd.	P. R. Whitman, A.A.C.I.	
B. McKenney	B. McKenney	
Energy Resources Conservation Board (Board Staff)*	A. L. McLarty R. W. Edgecombe, P. Eng. K. Sharp, P. Eng.	

1.3 Background

Imperial has operated seven sour gas wells, a related gas gathering system and a sour gas processing plant in the Quirk Creek Field since 1971. Declining well productivity caused Imperial to proceed with plans to provide for increasing production to the plant by drilling two additional wells. To date one well has been completed and the proposed well would be the second.

The Board, after publishing notice thereof and without receiving any objections thereto, approved an application by Imperial for a special target area for the proposed well with the issuance of Board Order No. SU 854 dated August 22, 1975.

When Imperial applied for a licence to drill the proposed well it indicated that it had been unable to obtain consent to enter upon the property from Miss Zahava Hanen of Rumsey Ranches Limited who holds a grazing lease on the quarter section. Imperial advised that if a licence was granted it would proceed with an application for a Right of Entry Order under the Surface Rights Ac

2 AUTHORITY

In its intervention Three Point Creek Ranching submitted that the Board had not the authority to issue the licence applied for when it was aware that the drilling of the well would adversely affect lands other than those on which it is drilled. The applicant opposed this contention. The Board ruled that it would proceed to hear the application, assuming that it did have the authority being questioned.

The Board has considered the arguments presented on behalf of Three Point Creek Ranching and the applicant with particular regard to the authority assigned to the Board by The Energy Resources Conservation Act and The Oil and Gas Conservation Act and the Board is satisfied that it is authorized to consider the subject well licence application and to make a decision on the application.

3 ISSUES

3.1 The Need for the Well

Imperial submitted that for it to maintain efficient operating levels at the plant and to meet contract requirements from the Rundle A Pool it is necessary to drill the proposed development well. It stated that the well location in Legal Subdivision 4 was to provide maximum opportunity to obtain a thick pay section and hence high productivity. The applicant also contended that the proposed well may significantly increase recovery from the pool.

None of the interveners challenged the need for the well or its subsurface location.

The Board agrees that the proposed well is needed to improve the rate of production from the pool and may improve ultimate recovery from the pool.

3.2 Safety Precautions

Imperial explained in considerable detail the equipment design features and the precautions taken during the drilling and operation of a sour gas well and the operation of related pipeline facilities to prevent the occurrence of an uncontrolled flow of gas such as a blowout or pipeline rupture. In addition it outlined its 24 hour staffing of the operation and its procedure for notification of the residents in the event of a serious escape of sour gas.

The interveners submitted that at the present time there exists insufficient safety requirements to prevent the escape of sour gas from producing wells. Three Point Creek Ranching acknowledged that there are already in existence in the area sour gas wells and attendant facilities but submitted that the addition of further wells and facilities will increase the already existing risk. Three Point Creek Ranching did not submit any technical evidence to support its contention.

The interveners also stated that Imperial had not discussed its contingency plans with all of the residents in the area and further that Imperial's contingency plans were not adequate. The interveners suggested that an audible warning system be considered to warn people who might not be within reach of the telephone or not accessible to direct contact by plant personnel.

The Board disagrees with the interveners that there exists insufficient safety requirements to prevent the escape of sour gas from producing wells. The Board recognizes that no sour gas development can be designed and operated so as to provide a 100 per cent guarantee against an emergency type failure and the resulting emission of sour gas. However it believes that the existing safety requirements in the Province are such as to reduce to a reasonable minimum the risk of releases of sour gas in volumes which would be harmful to residents in the area of development.

With respect to the Quirk Creek area and the specific application, the Board believes Imperial has taken adequate precautions at its existing wells and associated facilities and that Imperial plans adequate precautions at its proposed well and associated facilities to prevent the uncontrolled flow of sour gas and to minimize the duration and quantity of flow in the event of an accident. The Board consequently is satisfied that any additional risk associated with the proposed well, will be minimal. However, it agrees with the interveners that Imperial's contingency plans for notification and evacuation of residents in the event of an uncontrolled sour gas escape may be deficient and require upgrading. The Board will follow up on these matters with Imperial and other operators in the area but does not believe its decision respecting the well licence application need be delayed until the provisions for contingency are reviewed or altered. In its review of the contingency plans the Board will have regard for the suggestions of the interveners and will advise them of any modifications required. The Board will also ensure that residents in the area are provided an opportunity to become aware of the contingency plans.

3.3 The Surface Location

Imperial stated that the surface location had been determined after selecting an optimum bottom hole location considering the geological nature of the reservoir. It further stated that the site selected is open pasture land and would not require the destruction of any trees.

With respect to the impact of the proposed surface location on adjacent areas the applicant presented the results of a calculation[*] of the areal extent of the 100 parts per million (ppm) and greater hydrogen sulphide gas concentration which could occur in the Quirk Creek area should there be an uncontrolled release of gas from the Imperial gas wells and gas gathering pipelines. Imperial said that the potential 100 ppm isopleth created by the existing wells and pipelines would be only slightly enlarged by the completion and production of the subject well and the enlargement would occur in an area remote from the lands of the interveners.

The interveners stated that the existence of the present wells, coupled with the addition of the proposed well, has had an adverse affect on the value of l in the area. They further submitted that if the proposed well is to be drilled, it was not desirable to have the well facilities visible from the road. The interveners thus proposed that the location be moved further to the north where it would be hidden from view. Miss Z. Hanen who holds a grazing lease on the quarter section in which the well would be located did not appear at the hearing but in an objection filed earlier her representative stated that "the proposed location is sited on one of the few pieces of open pasture on this grazing lease".

The Board has examined the aerial photograph of the quarter section, submitted by the applicant, and notes that a relatively modest relocation of the well site to the north and west would appear to effectively screen the well from the road and also avoid the use of the open pasture.

With respect to the impact on areas adjacent to the well site the Board concludes, based on the evidence presented and a calculation similar to Imperial's, that the well will alter only slightly the 100 ppm isopleth of the Quirk Creek production and gathering system and that a modest relocation of the well site to the north and west would have no significant impact on the 100 ppm isopleth for the total system. All things considered the Board believes that a more suitable location within the legal subdivision may be obtained to the north and west of the applicant's proposed surface location as shown on the attached sketch.

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[*] By the method used in "A Report by the Alberta Industry Government Sour Gas Environmental Committee on Guidelines for Urban Development in Relation to the Sour Gas Industry"

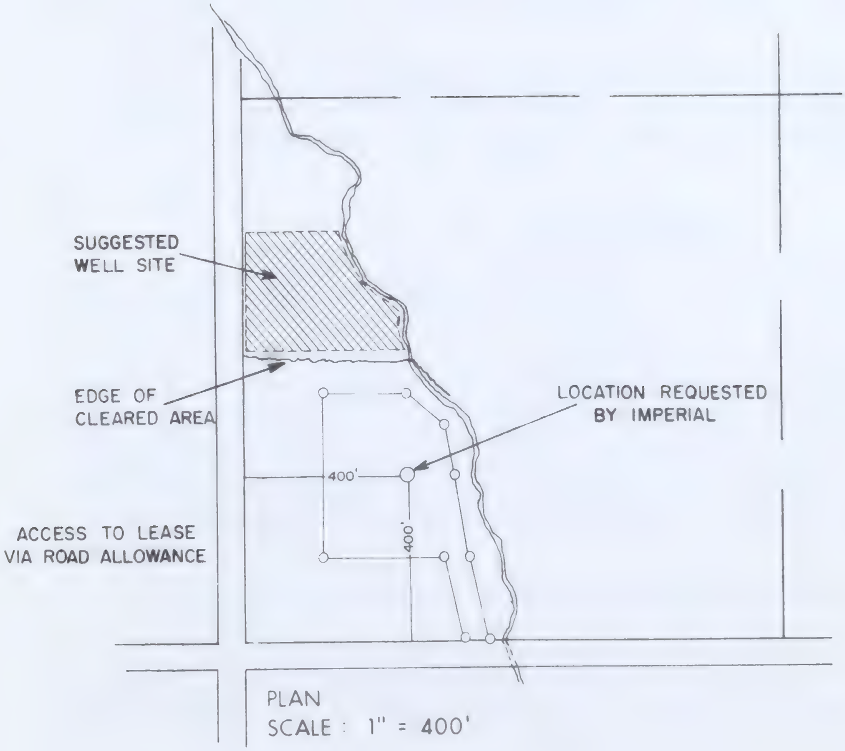
4 DECISION

The Board is prepared to grant Imperial's application for a licence to drill a well to be located in Legal Subdivision 4 of Section 4, Township 21, Range 4, West of the 5th Meridian for the purpose of obtaining and producing gas from the Rundle Formation. The precise location of the well within Legal Subdivision 4 is to be subject to Board approval and will be specified in the well licence to be issued.

ENERGY RESOURCES CONSERVATION BOARD

V. Millard
Vice Chairman

November 27, 1975



PROPOSED SURFACE LOCATION

I.O.E. HUSKY QUIRK 4-4-21-4W5

ENERGY RESOURCES CONSERVATIO
CALGARY, ALBERTA

ENERGY RESOURCES CONSERVATION BOARD

DECISION 75-16
APPLICATION NO. 8641

IN THE MATTER OF AN APPLICATION OF GREAT CANADIAN OIL SANDS LIMITED UNDER PART 8 OF THE OIL AND GAS CONSERVATION ACT

1. INTRODUCTION

1.1 The Application and Hearing

Great Canadian Oil Sands Limited applied pursuant to Part 8 of The Oil and Gas Conservation Act to amend the area of its Approval No. 1944 to include legal subdivisions 9, 10, 11, 12, 13, 14 and 15 of section 15, township 92, range 10, west of the 4th meridian, and some 10.96 acres along the north boundary of the south half of the said section 15. A total of some 290 acres of land would be added to the applicant's scheme.

No interventions were filed respecting the application.

The application was heard by the Board in Calgary, Alberta on 1 December 1975 with D. R. Craig, P. Eng., G. J. DeSorcy, P. Eng., and V. E. Bohme, P. Eng. sitting.

1.2 Appearances

The following appeared at the hearing:

	Represented by	Witnesses
Great Canadian Oil Sands Limited (Great Canadian)*	B.V. Massey, Q.C.	W. L. Oliver J. C. Anderson, P J. J. Fitzpatrick P. En
Board Staff	A. L. McLarty R. B. Dunbar, P. Eng.	

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* Abbreviation used in this report.

1.3 Background

Great Canadian had recently been successful in negotiating the acquisition of a portion of Bituminous Sands Lease No. 23, adjacent to its Lease No. 86, from Standard Oil of British Columbia. The lands acquired and the subject of this application are outlined on Figure 1, attached hereto. The Standard Oil lands were part of Lease 23 and contain some 290 acres. At the time the application was filed the Department of Energy and Natural Resources was considering an application for the transfer of these lands to Great Canadian.

The Board had a part in encouraging this transfer through a directive to Great Canadian that loss of otherwise recoverable oil sands along the lease boundary would not be permitted. The transfer of lands would enable Great Canadian to recover oil sands not otherwise accessible to them and would reduce the restriction to mining that would be caused by the irregular (saw tooth) shape of the lease boundary.

Prior to the hearing Great Canadian advised the Board that its extensive array of mining and conveying equipment was operating in close proximity to the area of application and that very substantial savings in time and money would be realized if, during the time required to give notice of the hearing and take a decision on the application, a temporary transfer of the equipment to another part of the pit could be avoided. Accordingly, pending the hearing and the Board's decision thereon, and recognizing that the application was in compliance with a conservation directive of the Board, the Board granted interim authorization to the mining and removal of oil sand from part of the area of application. This authorization was granted by letter dated 10 November 1975 and would be superseded by the decision of the Board pursuant to Application No. 8641 and, in any event, would lapse on 29 February 1976, if not superseded prior to that date.

2. SUBMISSION OF APPLICANT

In its application Great Canadian requested that the conditions contained in Board Approval No. 1944 also apply to the lands which it acquired from Standard Oil of British Columbia. At the hearing Great Canadian stated that it had received from the Department of Energy and Natural Resources the registered transfer of this portion of Lease No. 23 as well as copies of Bituminous Sands Lease No. 23A which Great Canadian was then in the process of executing.

Great Canadian estimated that these lands contained 54.8 million barrels of in place bitumen (assuming a 4 weight per cent bitumen saturation) and 34.2 million barrels of recoverable bitumen. Great Canadian indicated in the application that mining would proceed onto the acquired lands and also that a portion of the land would be used for the disposal of overburden. In response to a question by the Board staff Great Canadian acknowledged that the proposed mine limit and the proposed overburden disposal area shown in the application were indicated for illustrative purposes only and that separate approval would be required of the mine limit as part of the annual mine plan and of the proposed overburden disposal area.

3. VIEWS OF BOARD

Board staff evaluated the reserves associated with the lands acquired from Standard Oil and calculated that these lands contained 58.8 million barrels of in place bitumen (assuming a 3 weight per cent minimum bitumen saturation) and 30.2 million barrels of recoverable bitumen. These estimates are in good agreement with those submitted by Great Canadian. The additional reserves would represent an extension of the life o the scheme of approximately one year.

The Board notes that granting the application would only extend the boundaries of the Great Canadian operation and would not approve the proposed future mine limits and overburden disposal areas outlined in the application . Great Canadian would be required to comply with clause 6, subclause 2 of Approval No. 1944 and submit for the approval of the Board details of its annual mining plans for the entire area of operation (including the acquired lands). Great Canadian would also be required to comply with clause 7 of Approval No. 1944 and submit for the approval of the Board details respecting any proposed waste disposal areas. At the hearing Great Canadian acknowledged that it would be prepared to comply with the approval in this respect.

It is the Board's view that adding the lands acquired to the Great Canadian scheme would result in a more rational development of the mine and would facilitate conservation of crude bitumen by permitting Great Canadian to comply with the Board's directive that loss of oil sands along the lease boundary would not be permitted. Granting the application would benefit the Province as well as the applicant. Accordingly the

Board finds the amendment proposed by Great Canadian to be satisfactory.

4. MINISTERIAL APPROVAL

Section 43, subsection (1.1) of The Oil and Gas Conservation Act provides that

> 43. (1.1) the Board shall refer an application under subsection (1) that involves a scheme or operation for the removal of overburden and surface excavation of oil sands to the Minister of the Environment and the Minister of Energy and Natural Resources for their approval of the application as it affects matters of the environment.

The Board, in compliance with the above, has referred the application to the Minister of the Environment and the Minister of Energy and Natural Resources for their approvals of it as it affects matters of the environment.

An approval granted by the Board would be subject to any approvals given by the Ministers and the Board's approval would incorporate any conditions affecting matters of the environment imposed by the Ministers in their approvals.

5. DECISION

Having regard for its findings and its responsibility under The Oil and Gas Conservation Act, the Board is prepared, subject to the approvals of the Minister of the Environment and the Minister of Energy and Natural Resources with respect to matters of the environment, and with the authorization of the Lieutenant Governor in Council, to grant the application.

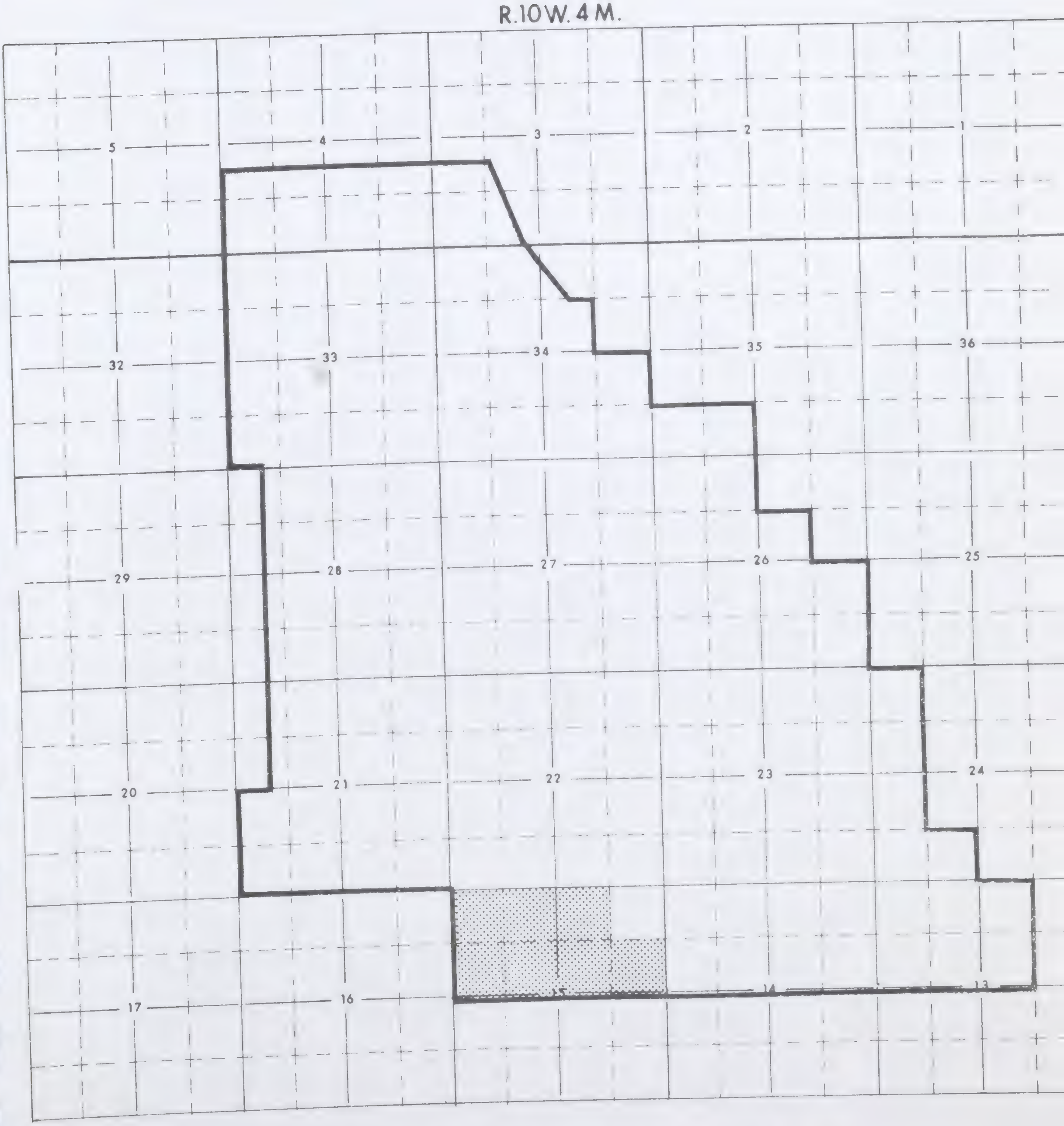
ENERGY RESOURCES CONSERVATION BOARD

D R Craig

D. R. Craig
Vice Chairman

DATED 17 December 1975
Calgary, Alberta

FIGURE I TO DECISION 75-16



SUBJECT AREA OF APPLICATION NO. 8641

ENERGY RESOURCES CONSERVATION BOARD
Calgary Alberta Canada

THE ALBERTA GAS TRUNK LINE COMPANY
LIMITED GAS LINE - FERINTOSH AREA

Decision 76-1
Application 8908

1 INTRODUCTION

1.1 The Application and Hearing

The Alberta Gas Trunk Line Company Limited filed an application on July 30, 1975 pursuant to Part 2 of The Pipe Line Act for a permit to construct a 6.625-inch diameter pipeline for the transmission of natural gas from its Ferintosh meter station to the Wood River meter station. Subsequent to filing the application, Trunk Line advised the Board on October 14, 1975 that the necessary right of way agreements and consents of occupants had been obtained, and that application to the Crown for pipeline agreements had been made. The length of the subject pipeline was stated in the applicant's submission to be 18.5 miles in length; the applicant subsequently revised this length to 19.4 miles, based upon field survey data.

A hearing of the application was held on December 8, 1975 before the Energy Resources Conservation Board, with D. R. Craig, P. Eng., Dr. N. Berkowitz and V. E. Bohme, P. Eng. sitting. The following appeared at the hearing:

Represented by	Witnesses
The Alberta Gas Trunk Line Company Limited (Trunk Line)	
G. R. Forsyth, Q.C. H. D. Williamson	F. C. Hagedorn, P. Eng. M. E. Kilik, P. Eng. (of Pan-Alberta Gas Ltd. (Pan-Alberta)) D. G. Olafson, P. Eng.
Northwestern Utilities Limited and Canadian Western Natural Gas Company Limited (Alberta Utilities)	
J. W. Beames, Q.C.	D. L. Weiss, P. Eng.
Energy Resources Conservation Board (Board)	
N. A. Macleod, Q.C. J. S. Owen D. G. Pearson, P. Eng.	

Note: Abbreviations shown in parentheses are used in this report.

2 DEFINITION OF THE ISSUES

The Board considers the issues of this application to be

a. the need for a pipeline, and

b. the suitability of the proposed pipeline.

At the outset of the hearing it was questioned whether it was appropriate for the Board to consider the economic aspects of the proposed pipeline. On this matter, the Board noted at the hearing that the relevant legislation provides for assessment of the public interest and this, in its view, must include a broad economic assessment of the proposed pipeline.

3 VIEWS OF THE APPLICANT

Trunk Line stated that the proposed pipeline, the construction of which was requested by Pan-Alberta, would allow that company to market gas produced in the Ferintosh area. The gas would be removed from the Province, under the provisions of Permit No. PA 74-1, granted to Pan-Alberta on July 2, 1974. This permit is for a total of 975 Bcf, and expires on October 31, 1980. Pan-Alberta had requested that the facilities provided by Trunk Line be capable of transporting 7 MMcf/d. Trunk Line stated that a 4-inch diameter line without compression could only move 5.25 MMcf/d, and it had therefore selected a 6-inch diameter pipeline, which would have sufficient capacity to transport 15 MMcf/d with no compression facilities. Trunk Line stated that it is not its general policy to design a line without any excess capacity, unless specifically requested to do so by a customer and in the case of the subject line, no such limitation was requested by Pan-Alberta. In a statement filed after the hearing at the request of the Board, Trunk Line stated that a 4-inch line with sufficient compression to raise its capacity to 7 MMcf/d would cost approximately $20,000 more than the proposed 6-inch line.

The applicant considered that the proposed pipeline would provide a twofold benefit, in that the producers would obtain the facilities necessary to move the contracted reserves, and the Alberta public interest would be served since the pipeline would lead to further development in the area. Trunk Line also contended that the "rolling in" method of cost recovery results in a minimal effect on transportation costs. The proposed pipeline would increase the costs paid by Pan-Alberta by approximately 0.2 cents per Mcf, and raise Trunk Line's overall system transportation costs by about 0.01 cents per Mcf. Trunk Line stated that its accounting method would ensure recovery of all costs from Pan-Alberta if future development did not result in other gas purchasers using the excess capacity of the proposed pipeline.

4 VIEWS OF ALBERTA UTILITIES

The Alberta Utilities stated they were not opposed to the proposed pipeline so long as the producers of gas transported by the pipeline paid for the costs of the line. The Utilities contended that there was not a reasonable likelihood of the existence of other reserves in the area which could be developed and transported through the proposed pipeline in the future, and that construction of the proposed pipeline could not be economically justified if the only volumes of gas to be transported are the 6.7 Bcf for which Pan-Alberta now has contracted. They expressed the view that excessive transportation costs associated with this pipeline would not be borne by the producers but would, through application of regulations that may be made under The Natural Gas Pricing Agreement Act, have an adverse effect on the royalties payable to the Alberta Government; on Provincial producers through reduced netback; and on all consumers. They said that only extraprovincial customers would benefit.

5 VIEWS OF THE BOARD

The Board agrees with the applicant that there are proved gas reserves available for production in the Ferintosh area that could be moved to market through the proposed pipeline. The Board also agrees that, if there is exploratory potential in the area, such a pipeline would likely stimulate further development and therefore excess capacity in the pipeline design beyond immediate needs could be a desirable feature. To determine whether the subject area has potential for further development of gas reserves the Board has reviewed the exploratory effort in the area. The Board notes that in addition to the 6.7 Bcf of reserves of gas to be connected to the proposed pipeline at Ferintosh there are some 3 or 4 Bcf of other proved reserves along the proposed pipeline which could be tied into the pipeline. The Board also notes that some 60 wells have been drilled within a radius of about 7 miles of the Ferintosh meter station; over one-half of these wells were drilled prior to 1960. The Board believes that most of the wells drilled prior to 1960 were most likely drilled in search for oil. While there has been significant exploratory effort in the area, the Board concludes that there still remains a likelihood of the discovery in the area of further reserves of gas. The Board considers it reasonable to expect that further drilling in the near term could result in the finding of an additional 5 to 10 Bcf of gas that could be transported through the proposed pipeline. Accordingly, the Board considers there to be a reasonable need for the pipeline proposed by the applicant.

With respect to the economic consequences of constructing the pipeline, the Board does have some concern that, if no further reserves are found or connected in the area, then the cost of transporting the 6.7 Bcf to be connected through the proposed line would be some 22 to 27 cents per Mcf, roughly estimated on the basis of 12 cents per Mcf for capital costs and some 10 to 15 cents per Mcf for operating and overhead costs

While this cost would be much higher than the tariff in effect for comparable gas volumes and distances elsewhere, the Board does not consider it so high as to indicate that the construction of the line would be an improvident venture, having regard to the further development potential in the area and the present and possible future level of natural gas prices.

The Board understands the basis of the Alberta Utilities' concern over the effect of possible regulations under The Natural Gas Pricing Agreement Act upon natural gas producers in the Province. It notes that the current practice of Trunk Line leads to some leveling of gas transportation tariffs between near and distant pools from which gas is going to a single purchaser. It appears that this could become more extensive and result in tariff-leveling among purchasers and effect reserves that would have widely varying carrying costs. The Board considers tariff-leveling to have some beneficial features but none the less believes it to be in the public interest that each pipeline and pipeline extension be a sound business venture.

6 DECISION

The Board grants the application by Trunk Line and will issue a permit for the construction of the proposed 6-inch diameter, 19.4-mile pipeline for the transmission of natural gas from the Ferintosh area to the Wood River meter station of Trunk Line.

ENERGY RESOURCES CONSERVATION BOARD

D R Craig

D. R. Craig, P. Eng.
Vice Chairman

DATED 30 January 1976
Calgary, Alberta

ENERGY RESOURCES CONSERVATION BOARD
Calgary Alberta Canada

PROCESSING PLANT ON THE NORTHWESTERN UTILITIES LIMITED PIPELINE SYSTEM

Decision 76-2
Application 8856

1 INTRODUCTION

1.1 The Application and Hearing

Dome Petroleum Limited and Canadian Utilities Limited applied for approval to expand the Edmonton Liquid Gas (straddle) plant located on the Northwestern Utilities Limited pipeline system within the southern boundary of the City of Edmonton. The daily plant capacity would be increased from 80 to 315 million cubic feet of pipeline specification gas from which some 23,490 barrels of ethane, 8,200 barrels of propane, butanes and pentanes plus mix and 275 million cubic feet of residue gas would be recovered. The existing plant is designed to process 80 million cubic feet of gas from which 72 million cubic feet of residue gas, and a maximum of 2,200 barrels of propane, 770 barrels of butanes, and 630 barrels of pentanes plus is recovered.

The application was heard by the Board on January 20 and 21, 1976 at The Law Courts in Edmonton with Vernon Millard, D.R. Craig, P.Eng., and G.J. DeSorcy, P.Eng. sitting.

1.2 Appearances

The following appeared at the hearing:

	Represented by	Witnesses	
Dome Petroleum Limited and Canadian Utilities Limited (Dome)			
	R.C. Muir	D.L. Weiss W.L. Grayburn, P.Eng.	)Both of)Northwe Utiliti Limite

	Represented by	Witnesses
		E.M. Berlie, P.Eng. (Western Research and Development Limited)
		W.B. Masson, P.Eng.
		E.A. Wetherall, P.Eng.
		D. Young)Both of Lombard R.V. Peiluck)North Group Ltd.
		D.M. Wolcott
Albertan and Southern Gas Co. Ltd.	R.A. MacKimmie, Q.C. F.G. Homer	
Amoco Canada Petroleum Company Limited	D.E. Ashurst	F.B. Matthews, P.Eng.
Alldritt Development Limited Qualico Development Limited Willowbrook Homes (1964) Ltd.	J.A. Cox	
Canadian Industries Limited (C.I.L.)	M.A. Putnam	
Carma Developers Ltd.	J.A. Bryan	
City of Edmonton (City)	H.F. Wilson	
Dow Chemical of Canada Limited (Dow)	J.L. Fingarson	
Gulf Oil Canada Limited	H.R. Ward	R.L. Clarke, P.Eng. S.E. Devaldriola, P.Eng.
Imperial Oil Limited (Imperial)	J.D. Bruce McDonald	L. Wolfe

Represented by Witnesses

PanCanadian Gas Products Limited
B.W. Jones

Texaco Exploration Canada Limited
W.F. Muscoby

The Alberta Ethylene Company Limited (Alberta Ethylene)
G.R. Forsyth, Q.C.

Energy Resources Conservation Board (Board)
A.L. McLarty
K.D. Adams, P.Eng.
R.J. Reimond, C.E.T.

Note: Abbreviations shown in parentheses are used in this report.

2 THE APPLICATION

The expanded plant proposed by Dome would consist of a turbo-expander process capable of processing at least 315 million cubic feet per day of pipeline gas and recovering 91 per cent of the ethane and essentially all of the propane, butanes, and pentanes plus contained in the gas. According to Dome, a higher ethane recovery level would not be feasible because of the solidification of carbon dioxide in the process equipment at the lower temperatures necessary to increase the recovery level.

Gas would be supplied by Northwestern Utilities Limited (N.U.L.). With respect to the availability of gas for future processing, N.U.L. stated that while it has only a portion of the gas under contract at present the long-term supply is assured since gas would continue to be required by the City of Edmonton, would be transported to the City through the N.U.L. pipeline system and thus, of necessity, would be available for processing. Respecting the gas not now under contract, N.U.L. said that it would contract for the gas from producers, or obtain it through existing contractual arrangements with transmission companies, as required from time to time.

Dome stated that the supply of ethane to the C.I.L. petrochemical plant at Edmonton, as is required by Gas Utilities Board Approval 72-1, would not be interrupted. Dome also said that it recognized the right of producers to recover liquids from gas streams at field plants upstream of the proposed plant. Dome stated however, that the operation of ethane recovery facilities at field plants might adversely affect the economics of the proposed straddle plant and result in a lower overall ethane recovery level. For this reason, Dome indicated that although it was not asking the Board to impose any restrictions on applications for upstream field ethane recovery facilities, Dome would wish to review such applications and participate at the hearings.

With respect to the general question of whether it is more beneficial that ethane be extracted in straddle plants rather than in field plants, Dome said "the construction of innumerable field processing plants around the Province for the extraction of ethane and the movement of that ethane to gathering systems would be far more uneconomic, and in fact would be completely uneconomic, compared to the economics of the present plan which is to have a limited number of straddle plants and a central, single gathering system".

With respect to the environment, Dome proposed to upgrade product odourization, the treatment of waste water, product storage facilities and the emergency flare facilities to minimize the emission of gaseous or liquid pollutants and odours. The pollutant emission rates would be within the levels established by the Board and the Department of the Environment. Noise levels would be minimized by installing adequate exhaust silencers and by the housing of noisy equipment such that noise levels from the plant would be within the Board's noise guidelines specified in Interim Directive ID 73-1. Visual impact of the plant will be reduced through the use of landscaping and painting of the plant in colours to blend with the surroundings.

Dome analysed the suitability of several alternate plant sites and concluded that the site adjacent to the existing plant was the most suitable. One reason for this was that a site farther from the City of Edmonton would require costly rerouting of pipelines resulting in greater costs and undesirable additional environmental impact. An alternate site at any other point where the gas supply lines run parallel to each other would be even less desirable since it would be nearer the Edmonton city centre and would encroach even further on existing and proposed housing developments with the City. Also, Dome said that locating the proposed expansion away from the existing plant would not result in the dismantling of the existing plant, with the net result two plants would exist. This would be undesirable from both an economic and conservation viewpoint.

Dome contended that the proposed expanded plant would be in the public interest in that the environmental impact would be less than for the existing plant, a raw material would be upgraded to a petrochemical feedstock to be used in the Province, and Alberta-based material and manpower would be used in the construction and operation of the plant. For residents of the City of Edmonton, the proposed plant would increase the tax base. It would also increase the load and improve the load factor for the gas supply to the City, level the B.T.U. fluctuations of the City's gas supply, and, in Dome's view, could result in a lower unit cost for gas to the City. Dome said the plant would be a large consumer of electric energy and because of this the cost of electric energy to other consumers could be reduced.

3 THE INTERVENTIONS

A number of producers intervened and stated that since much of the gas which Dome has forecast to be available for processing at the Edmonton plant is not under contract to N.U.L., the feedstock for the plant is not assured. In addition, they pointed out that the composition of the gas and the ethane content could vary substantially because of changes in the source of the gas or the prior recovery of the liquids by producers before the sale of gas to N.U.L. Many of the producer-interveners expressed concern that approval of the proposed plant might affect the right they have to extract hydrocarbon liquids, including ethane, prior to the delivery of gas to N.U.L. They indicated that they may wish to extract the ethane and other liquid hydrocarbons at field processing plants.

Imperial and C.I.L. both stated that, in accordance with Gas Utilities Board Approval 72-1, Imperial is required to supply gas to N.U.L. from the Judy Creek Gas Processing Complex from which only limited amounts of ethane have been removed. In addition, Imperial contended that N.U.L. does not have the right to extract or permit others to extract ethane from that gas.

Dow and Alberta Ethylene supported the application stating that they require a secure supply of ethane at a reasonable cost. They expressed the view that straddle plants would offer such a supply but that the field processing plants would not.

Several interveners, most notably the City of Edmonton and the housing developers, indicated concern that environmental control features which are to be included in the proposed plant might be delayed in their installation or not installed at all if the application is approved. They generally indicated however, that if the environmental controls that Dome is proposing are in fact installed, the environmental aspects of the proposed plant should be satisfactory.

The City of Edmonton suggested that the application might be referred to the Gas Utilities Board. Alternatively it said that if the ERCB grants an approval it should be conditional upon a development permit being obtained from the City.

4 VIEWS OF THE BOARD

In considering the Dome application, the Board believes the relevant issues are as follows:

(a) the technical design and conservation features of the proposed facilities,
(b) the ownership and the ethane content of the gas to be processed,
(c) the location and the impact on the environment of the proposed facilities, and
(d) other public interest or miscellaneous aspects of the proposed scheme.

The Board is of the view that the technical design and conservation features of the proposed plant are satisfactory. It notes that none of the interveners commented on this matter. The Board is not prepared to accept the request made at the hearing by the applicant that to provide flexibility, no inlet rate restriction be set. The Board does see some need for flexibility and would stipulate a maximum throughput for gas some 10 per cent higher than the 315 million cubic feet per day design rate referred to in the application. The Board would not specify a required minimum or maximum ethane recovery since it is satisfied it would be in the applicant's interest to maximize recovery and in any case, the ethane not recovered would not be wasted but would be utilized as fuel.

The Board tends to agree with the applicant that there may be certain economic and conservation advantages in recovering ethane at straddle plants rather than field plants and thus the overall ethane recovery level might be greater if straddle plants are the principal mode of recovery. However, the Board recognizes that this would not necessarily be the situation in all instances. In any case, if an approval for ethane recovery at a straddle plant was issued, this would not preclude the approval of an application to install ethane recovery facilities in a field plant upstream of the straddle plant. Such application would be considered by the Board in the light of circumstances prevailing at the time.

The Board recognizes that much of the gas intended for processing at the proposed plant is not now under contract to N.U.L. However, the Board agrees with the applicant that the growing gas requirements of the City of Edmonton will have to be met and consequently N.U.L. will be transporting in its pipelines volumes of gas at least equal to the volumes intended for processing. The Board notes that some of this gas may be delivered to N.U.L. in accordance with contractual arrangements between it and major transmission companies rather than through direct contracts with the producers. With respect to the possibility that the ethane content of the stream to be processed may vary over the life of the proposed plant, it is the Board's view that this could occur. The gas in the Trunkline Foothills System has an ethane content lower than that in the analysis used for design of the proposed plant. An estimate of the possible effect on ethane recovery was made by the Board assuming the gas to be processed would consist entirely of a commingled gas stream from The Alberta Gas Trunkline Foothills System. The applicant's 91 per cent ethane recovery efficiency was retained. The Board's calculation suggests that ethane recovered could be as low as about one half the recovery of 23,490 barrels per day projected by Dome. A lower than projected ethane recovery is also possible having regard for the Board's position that an approval of the applied-for facilities would not preclude the subsequent approval by the Board and the installation of ethane recovery facilities in field locations upstream of the plant. Such possibility is, in the Board's view, a business risk which the applicant would have to contend with. The Board concurs with the view generally put forward at the hearing that approval of the proposed scheme and arrangements between N.U.L. and Dome must not interfere with the requirements of Gas Utilities Board Approval 72-1 as it relates to a supply of ethane to C.I.L.

The Board does not believe it is necessary that the subject application be referred to the Gas Utilities Board.

With respect to environmental aspects of the proposed plant, the Board concurs with Dome's argument and reasons for locating the proposed plant on the existing plant site. The Board notes that the environmental concerns expressed by interveners at the hearing dealt mainly with the possibility that the applicant's environmental control plans might not be implemented, rather than with shortcomings in the plans. The Board is satisfied that the proposed modifications, new equipment, and landscaping are acceptable. However, in order to ensure the orderly implementation of the proposed controls, the Board would require that Dome proceed with the proposed modification, new equipment, and landscaping and provide it with the implementation schedule it intends to follow respecting these matters. The Board would also require periodic progress reports.

With respect to the public interest features suggested by the applicant, Alberta Ethylene and Dow, the Board accepts that there may be public interest benefits relating to the proposal which would accrue to the Province as a whole and to the City of Edmonton. With respect to the City of Edmonton's suggestion that any approval issued be conditional upon the granting by the City of a development permit, the Board notes that a development permit will have to be obtained by the applicant but sees no need to make it a condition of an approval.

5 MINISTERIAL APPROVAL

Section 38 subsection (2) of The Oil and Gas Conservation Act provides that

> 38. (2) Prior to the Board approving a scheme under subsection (1), clause (b) or (d) it shall refer the application to the Minister of the Environment for his approval with respect to the application as it affects matters of the environment.

The Board, in compliance with the above has referred the application to the Minister of the Environment for his approval of it as it affects matters of the environment and the Minister's approval will be appended to and made a condition of the Board Approval, such that the Board's Approval will be subject to the same conditions imposed by the Minister when he gave his approval.

6 DECISION

The Board is prepared to grant the application by Dome to expand its Edmonton Liquid Gas straddle plant located in the south west quarter of Section 4, Township 51, Range 24, West of the 4th Meridian in accordance with the views of the Board as expressed in this report. Board Approval No. 2226 will be issued if and when the Minister of the Environment gives his approval of the application.

ENERGY RESOURCES CONSERVATION BOARD

D R Craig

D. R. Craig
Vice Chairman

DATED April 23, 1976
Calgary Alberta

OGAR*4 BRAR-4 WAR-4 PLAR-4 CAR-
IL-3 ILC-3 ILHL-3 ILOG-3 ILPL-3
IDL-3 ID-3 IDHL-3 IDOG-3 IDPL-3
CA-1 DEC-2 Gen-2 O&A-1

ENERGY RESOURCES CONSERVATION BOARD
Calgary Alberta Canada

PROCESSING PLANT ON THE NORTHWESTERN UTILITIES LIMITED PIPELINES SYSTEM

ADDENDUM TO
Decision 76-2
Application No. 8856

The Board has noted that in section 6 of its Decision 76-2, dated 23 April 1976, the Edmonton Liquid Gas straddle plant is referred to as located in the south west quarter of Section 4, Township 51, Range 24, West of the 4th Meridian. The correct location of the existing plant is the south west quarter of Section 4, Township 52, Range 24, West of the 4th Meridian and this addendum amends Decision 76-2 accordingly.

ENERGY RESOURCES CONSERVATION BOARD

G J DeSorcy

G. J. DeSorcy, P. Eng.
Board Member

DATED 13 May 1976
Calgary, Alberta

ENERGY RESOURCES CONSERVATION BOARD
Calgary Alberta

ANNUAL RESERVES AND MAXIMUM RATE LIMITATIONS FOR OIL POOLS

Decision 76-3
Proceeding 8932

CONTENTS

1. Introduction
2. Joarcam Viking Pool
3. Joffre Blairmore B Pool
4. Wildmere Lloydminster A Pool
5. Golden Spike D-3B Pool
6. Recommendations and Decision

1. INTRODUCTION

The Hearing

Recently, examiners appointed by the Energy Resources Conservation Board heard representations to revise the crude oil reserves and maximum rate limitations for pools listed in the Notice of Hearing issued 18 December 1975.

The hearing was conducted by J. A. Bray, P.Eng., W. Wolff, P.Eng., and G. H. Stafford, P.Geol., on 26 January 1976. The following were represented at the hearing:

THOSE APPEARING

Principal (Abbreviation Used in Report)	Representatives
Great Northern Oil, Ltd. (GNOL)	R. A. Beamish, P.Eng.
Husky Oil Operations Ltd. (Husky)	M. N. Raicar, P.Eng.
Imperial Oil Limited (Imperial)	G. Callow F. Buccini
Norcen Energy Resources Limited (Norcen)	F. D. Kirkham
Energy Resources Conservation Board (Board Staff)	D. H. Burger, P.Eng. R. O'Brien, P.Geol.

Glossary

The terms and abbreviations used in this report are consistent with those used in the Board's report, "Reserves of Crude Oil, Gas, Natural Gas Liquids and Sulphur, Province of Alberta" - ERCB 75-18.

The abbreviations used in this report are as follows:

Bopd	barrels of oil per day
ft	feet
frac	fraction
GPP	good production practice
md	millidarcies
MRL	maximum rate limitation
N	initial oil in place
psi	pounds per square inch
Ri	recovery factor
RiN	recoverable reserves
stb	stock tank barrel
WOR	water-oil ratio

In this report the terms Legal Subdivision, Section, Township, and Range are used to denote a well location. For example, "the 9-14-39-27 well" or "the well in 9-14-39-27" denotes the well located in Legal Subdivision 9, Section 14, Township 39, Range 27. The meridian involved is obvious from the location of the pools under consideration.

2. JOARCAM VIKING POOL

Norcen's Views

Norcen said that primary reserves for the Joarcam Viking Pool had proved difficult to ascertain over the twenty-five years of production history. The last detailed study was in 1969, at which time recoverable reserves were set at 28 million stb for the primary area. The average reservoir pressure in the primary area has dropped only some 250 psi since discovery. In addition, after two years of production at well capacity under GPP, no significant decline in productivity was realized. This performance indicated an extremely active water drive and gas-cap expansion drive were efficiently displacing the oil. A relatively high primary recovery factor was indicated.

Norcen was unable to complete a reservoir study by the hearing deadline and accordingly requested a deferment of the hearing on this pool. Norcen said it believed this was justified in view of the considerable difficulty in estimating recovery, due to the age and number of wells, uncertainty of obtaining reasonable averages for reservoir parameters, and undeterminable gas-cap size. Furthermore, it was evident that the matter of ultimate reserves was not settled satisfactorily in 1969, and it would not be prudent to make a hasty redetermination.

Norcen's approach to determining reserves was based on the nonlinear form of the material balance equation. Norcen said it would check the final water influx from the material balance study against that calculated from production history using an assumed residual oil saturation.

Pending completion of the reserves study, Norcen recommended that the mineral assessor's 1975 estimate of remaining recoverable reserves be used. Norcen anticipated completion of the reservoir study by the first week in March 1976.

The Examiners' Views

Because cumulative production will exceed currently set reserves within two years, estimated recoverable reserves for the primary area of the Joarcam Viking Pool must be revised upward. Preliminary studies, based mainly on productivity decline analysis, indicated this increase may be in the order of 20 per cent. Previous reservoir studies have resulted in an increase of the net reservoir rock volume to account for production approaching the estimated recoverable reserves. Although it is evident that the reserves estimate needs to be increased, the examiners find insufficient data available at this time to determine whether the extended productivity of the pool is related to a low oil in place, as presently established, or a low estimated recovery factor.

The examiners, therefore, find it appropriate to retain the present estimate of recoverable reserves until such time as a completed reservoir study is avilable. The examiners recommend that the Board call a reserves hearing on the subject pool upon receipt of an appropriately detailed study.

3. JOFFRE BLAIRMORE B POOL

Imperial's Views

Imperial estimated the oil in place of the Joffre Blairmore B Pool to be 2,792,000 stb and the recoverable reserves to be 363,000 stb. The reserves estimate was based on a rock volume of 6,700 acre-ft determined from a net pay isopach map and adoption of the Board's currently estimated porosity of 0.10, water saturation of 0.32, shrinkage factor of 0.79, and a recovery factor of 0.13.

In answer to questions regarding the presence of the Blairmore sand in surrounding wells, Imperial stated that the only well to have the sand present in an equivalent stratum, other than the two wells which are assigned pay in the Blairmore B Pool, was in 3-24-39-27. Using this well and other surrounding wells for control, Imperial interpreted the areal extent of the pool to be 512 acres.

Imperial said it did not believe there was sufficient pressure data to attempt any material balance calculations to support the rock volume used in its oil-in-place calculations. Further, for the purpose of determining recoverable reserves, the Board's estimated recovery factor of 0.13 was adopted on the basis that it was acceptable when compared to similar Mannville pools having recoveries in the range of 0.10 - 0.15. When questioned about the increasing gas-oil ratios, Imperial indicated that there was the possibility of a small gas cap in the pool. However, it would be too small to have any significant effects on oil recovery.

The Examiners' Views

The examiners note that there is a significant difference in the rock volume suggested by Imperial and that estimated by the Board staff. The difference results from the Board staff estimating thinner oil pays and a lesser areal extent to the pool. The areal extent of Imperial's isopach map is considered optimistic, especially in the south and west extremities of the pool. Further, Imperial interpreted a 20-ft contour as compared to a maximum 15-ft contour used by the Board staff in estimating the pool's rock volume.

The examiners are of the opinion that the porosity of 0.10 and water saturation of 0.32 should be revised to reflect values which are more consistent with other Blairmore pools. Specifically, the porosity determined from core analysis data on the well located in 11-7-39-26 (Blairmore A Pool) is considered to be representative. The examiners believe that the currently established shrinkage factor is reasonable. The examiners note that the pool's producing gas-oil ratios are increasing and consequently are concerned that the 11-13 well, the only productive well in the pool, will not be able to produce the pool's estimated recoverable reserves as proposed by Imperial. Further, after examining drill stem test data, the examiners question whether or not there is mobile oil in the area of the 9-14-39-27 well.

The examiners recommend adoption of the following reserves factors:

rock volume (acre-ft)	3,200
porosity (frac)	0.13
water saturation (frac)	0.25
shrinkage factor (frac)	0.79

In light of the foregoing, the examiners recommend assigning the following reserve values for the Blairmore B Pool:

N (thousand stb)	1,910
Ri (frac)	0.13
RiN (thousand stb)	248

4. WILDMERE LLOYDMINSTER A POOL

GNOL's and Husky's Views on Reserves

The Wildmere Lloydminster A Pool is a hydrocarbon accumulation in the Upper Mannville Lloydminster sand of the Lower Cretaceous system. GNOL submitted that the rock volume within the area of the Board's G Order as prescribed at year-end 1975 was 75,492 acre-ft. In accordance with discussions between GNOL and the Board staff, GNOL provided a supplement to its original submission at the reserves hearing, which considered twenty-two additional wells drilled outside the G Order boundary. GNOL proposed that an additional 39,497 acre-ft be added to its original rock volume, to give a total of 114,989 acre-ft.

GNOL mapped the western half of Section 26-47-5 as a separate hydrocarbon entity, separated from the main pool by a channel, but included it in the pool's total rock volume. In answer to questions by the Board staff, GNOL indicated that the separation was interpretative. GNOL did not include certain tracts drilled in Sections 7 and 8-47-4 and in Sections 12 and 25-47-5 in its estimate of the pool rock volume because of the lack of data and speculative extent of the pool at these points.

GNOL proposed a pool average weighted porosity of 0.315 on the basis of core analysis data, using porosity and permeability cut offs of 20.9 per cent and 2.3 md respectively. The porosity cut off was determined from a special core study on the well 6C-19-47-4. The water saturation of 0.234 was also determined from core analysis data. However, the value was adjusted using a core-log correlation because the cores were obtained using water base muds.

Using its estimated values for rock volume, porosity, water saturation and a shrinkage factor of 0.97 obtained from analysis of two recombined reservoir fluid samples, GNOL proposed an oil-in-place estimate of 209 million stb. GNOL submitted that a primary recovery factor of 0.06 be used in calculating recoverable oil reserves for the pool based on results of two primary prediction runs using a Muskat solution-gas-drive model. GNOL indicated that relative permeability data for the pool was not suitable at the time of its study and that representative relative permeability data were obtained from the Sparky zone of the South Epping Unit No. 1 in Saskatchewan. When questioned as to its confidence in the predicted recovery factors, Husky indicated that a history match was obtained in the Epping Field using the Muskat prediction and that a similar type of sand existed in the Lloydminster A Pool. However, there was little performance data from the subject pool to support the predicted recovery.

Husky further mentioned that preliminary results of a special core study in Lloydminster A Pool supported the data from the South Epping Unit No. 1. Husky had only done quick calculations on the new data, but more thorough calculations were in progress.

The Examiners' Views on Reserves

The examiners accept GNOL's supplemental reserves submission on the basis that it, together with the original, provides a more accurate estimate of the pool's reserves at 1975 year-end. The examiners agree with most of the areas included by GNOL for the determination of the rock volume. They are of the opinion that in some areas, GNOL's contouring is overly optimistic, and therefore contend that limiting the areal extent of the isopach in some areas provides a more reasonable estimate of the rock volume.

With respect to water saturation, the examiners are not entirely convinced that conventional cores obtained using a water base mud can be used to determine water or oil saturations. However, they agree that a water saturation of 0.23 as proposed by GNOL is supported by log data.

The examiners would prefer that the primary prediction methods of either Muskat* or Tracy**, be supported by production and pressure history. In this regard, the examiners do not believe there is sufficient data on the Lloydminster A Pool at this time to change the primary recovery factor of 0.05.

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*M. Muskat, "The Production Histories of Oil Producing Gas-drive Reservoirs", Journal of Applied Physics, (1945), 16, 147.

**G. W. Tracy, "Simplified Form of the Material Balance Equation", Trans AIME, (1955), 204, 243.

The examiners recommend the adoption of the following reserve factors:

rock volume (acre-ft)	110,000
porosity (frac)	0.32
water saturation (frac)	0.23
shrinkage (frac)	0.97

In view of the foregoing, the examiners recommend assigning the following reserve values for the Lloydminster A Pool:

N (thousand stb)	204,000
Ri (frac)	0.05
RiN (thousand stb)	10,200

GNOL's Views on Maximum Rate Limitation

In answer to a question regarding the method of establishing an MRL for the pool, GNOL said one of the major problems was sand production and that seriously limited production rates in the pool could cause the shutting in of the wells. This in turn leads to the expensive and time-consuming job of placing the wells back on production. Furthermore, the pool is currently under pipeline proration which effectively curtails production.

GNOL indicated that it was unable to file the MRL submission by the required date of 15 January 1976, but that more meaningful information would be presented later. GNOL requested that the requirement to submit data with respect to the pool's MRL be postponed for from six to twelve months pending further development of the pool and to permit completion of gas conservation and enhanced recovery studies. For this period, GNOL requested that it be permitted to continue to produce in accordance with good production practice.

The Examiners' Views on Maximum Rate Limitation

The examiners agree that an MRL study in one year's time would provide more meaningful data. It could be made in conjunction with enhanced recovery studies. A review of the performance data in the pool to date does not show any adverse gas-oil or water-oil ratio problems. In this regard, the examiners recommend that the oil production from the pool continue to be subject to good production practice status.

5. GOLDEN SPIKE D-3B POOL

Imperial's Views on Reserves

The Golden Spike D-3B Pool is in the Lower Leduc reef build-up above the

Cooking Lake aquifer. The original oil water contact is located at 3,632 ft below sea level. The pool edge is established by the intersection of the original oil-water contact and the top of the structure. Imperial estimated the oil-zone rock volume to be 13,575 acre-ft, and together with an average porosity of 0.0625, a connate water saturation of 0.12 and a shrinkage factor of 0.81, Imperial determined the original oil in place to be 4,692 thousand stb.

A strong water drive is indicated by the pressure history of the pool. Imperial used production and completion data on two wells, 13-24 and 11-26, to estimate a rise in the oil-water contact of 20 feet. On the basis of this rise and an estimated cumulative production to 31 December 1975 of 992 thousand stb, the resulting recovery is 30.5 per cent of the invaded zone. As shrinkage and sandwich loss were considered negligible, the above recovery factor was applied to the pool's total original oil in place resulting in an estimated ultimate recovery of 1,431 thousand stb.

In addition, Imperial said that, because of the uncertainty in estimating the areal extent of the pool, the oil in place could be lower than calculated with a resulting higher recovery factor. Imperial considered the estimated recovery factor of 0.305 to be very conservative.

The Examiners' Views on Reserves

The examiners are in general agreement with Imperial's interpretation of reservoir volume and recovery factor. Small differences in interpretation result from the examiners' estimates of thinner oil pays and a less optimistic estimate of the areal extent of the pool. The examiners are in agreement with Imperial's estimate of the position of the original oil-water interface at 3,632 ft below sea level and consider a rise of 20 feet to be reasonable although highly interpretive. The above differences in interpretation result in a slightly lower original oil in place figure and a greater recovery factor than those submitted by Imperial. The examiners' estimated recovery factor of 0.35 is considered more reasonable because of the performance of similar D-3 reefs.

The examiners believe it appropriate that the previously established water saturation and shrinkage factors be retained. Because of additional information related to recent drilling, pool average porosity should be lowered. The examiners recommend adoption of the following reserves factors:

rock volume (acre-ft)	11,400
porosity (frac)	0.068
water saturation (frac)	0.12
shrinkage factor (frac)	0.81

Based on the foregoing, the examiners recommend assigning the following reserves factors for the Golden Spike D-3B Pool:

N (thousand stb)	4,290
Ri (frac)	0.35
RiN (thousand stb)	1,500

6. RECOMMENDATIONS AND DECISION

The examiners recommend that the reserves and factors set out in Table I be adopted. For convenience, a comparison of previously requested and recommended values is presented in Table II.

The examiners recommend that the Board call a reserves hearing on the primary depletion portion of the Joarcam Viking Pool upon receipt of Norcen's reserves study.

The Board agrees with the recommendations of the examiners and has adopted the reserves and reserves factors listed in Table I.

Dated at Calgary, Alberta, on 19 April 1976.

ENERGY RESOURCES CONSERVATION BOARD

D R Craig

D. R. Craig
Vice Chairman

TABLE I EXAMINERS' RECOMMENDED RESERVE FACTORS - POOLS CONSIDERED AT 26 JANUARY 1976 RESERVES HEARING

FORMATION POOL	(1) AREA (Acres)	(2) PAY THICKNESS (feet)	(3) POROSITY (Fraction)	(4) 1-WATER SATURATION (Fraction)	(5) OIL SHRINKAGE (stb/bbl)	(6) INITIAL OIL IN PLACE 10^3 stb	(7) POOL RECOVERY PRIMARY (Fraction)	(8) RECOVERABLE OIL PRIMARY 10^3 stb
MANNVILLE								
Joffre Blairmore B	400	(8.0)	0.13	0.75	0.79	1,910	0.13	248
Wildmere Lloydminster A	4,750	(23.2)	0.32	0.77	0.97	204,000	0.05	10,200
LEDUC								
Golden Spike D-3B	570	20	0.068	0.88	0.81	4,290	0.35	1,500

TABLE II COMPARISON OF OIL IN PLACE AND RECOVERABLE RESERVES

(Thousands of Stock Tank Barrels)

	Previous		Requested		Recomme	
Pools	N	RiN	N	RiN	N	
Joarcam Viking (Primary)*	80,000	28,000				
Joffre Blairmore B	1,100	143	2,792	363	1,910	
Wildmere Lloydminster A	21,200	1,060	209,000	12,500	204,000	1
Golden Spike D-3B	3,980	1,190	4,692	1,431	4,290	

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*Applicant requested deferment of date for filing submission.

ENERGY RESOURCES CONSERVATION BOARD
Calgary Alberta

TOWN OF BLAIRMORE
ALTERATION OF ELECTRICAL DISTRIBUTION SYSTEM

Decision 76-5
Application 8964

1 INTRODUCTION

1.1 The Application and Hearing

The subject application was made pursuant to the provisions of The Hydro and Electric Energy Act for approval of the alteration of the boundaries of the service area of the Town of Blairmore.

The Town of Blairmore requested the boundaries of its service area be enlarged to include the Town of Blairmore water pumphouse, arena, curling rink, school area and nine domestic services in the general area of the school all of which are located within its municipal boundaries. At the hearing, the applicant withdrew that portion of its application pertaining to the water pumphouse.

The application was heard by the Board at Blairmore on March 9, 1976, by D. R. Craig, P.Eng., G. J. DeSorcy, P.Eng. and C. J. Goodman, P.Eng.

1.2 Appearances

Principals and Representatives (Abbreviation Used in Report)	Witnesses
Town of Blairmore (Blairmore)	
J. J. Kryczka, Q.C.	J. Kapalka
Calgary Power Ltd. (Calgary Power)	
H. M. Kay	D. Lyons E. C. Chalmers M. Reno
Nine Residential Customers	
W. Cousens	W. F. Cousens
Energy Resources Conservation Board (Board)	
A. L. McLarty D. G. Beamer	

2 THE BACKGROUND, DEFINITION OF THE ISSUES AND THE APPLICATION

2.1 The Background

The Town of Blairmore operates an electric distribution system to supply customers within its prescribed service area with electric energy that it purchases under a wholesale agreement with Calgary Power. Customers within the town's municipal boundaries not served by Blairmore are supplied by an electric distribution system operated by Calgary Power. Calgary Power also operates the high-voltage transmission system in the Blairmore and Crowsnest Pass area and supplies electric energy to all of the electric distribution systems serving the area.

Section 22 of The Hydro and Electric Energy Act, with respect to electric distribution systems, required the Board to determine the service area of each existing electric distribution system in the Province as of the coming into effect of the Act on June 1, 1971. Having regard for this requirement and subsequent to a review of information submitted by all electric distribution system owners and operators, the Board on March 3, 1972, issued Approval No. HE 7211 which defined the Town of Blairmore service area. A copy of Approval No. HE 7211 is attached as Appendix A to this report.

The Board, in determining the service area of Blairmore's electric distribution system included all parts of the municipality of Blairmore except those parts being served by another operator of an electric distribution system, in this case Calgary Power, under agreement with Blairmore as provided for in section 22 of the Act. That portion of the municipality of Blairmore which is included in Calgary Power's service area is covered in the Board's approval of Calgary Power's service area, Approval No. HE 7601.

Section 23 of the Act provides for a local authority that owns and operates an electric distribution system to apply for an enlargement of its service area to include additional lands within its municipality. The relevant provision thereof is set out in clause 3 which reads as follows:

"(3) Where a local authority that owns and operates an electric distribution system applies for an enlargement of its service area to include additional lands within its municipality, the Board shall

(a) in respect of lands not included in the service area of another electric distribution system grant the application, or

(b) in respect of lands included in the service area of another electric distribution system, grant the application unless after a public hearing the Board finds compelling reasons in the public interest not to do so, in which case the Board with the approval of the Lieutenant Governor in Council may deny the application in whole or in part, and where the Board grants an application to which clause (b) applies it shall stipulate such terms and conditions as it considers reasonable including a stipulation of the date upon which the alteration of the service area comes into force."

2.2 Definition of the Issues

The Board, having regard for section 23 of The Hydro and Electric Energy Act, considers the principal issue to be whether there are compelling reasons in the public interest why Blairmore should not be granted an enlargement of its service area to include additional lands within its municipality. In considering this issue the Board has evaluated:

(a) the ability of the Town of Blairmore to provide adequate electric service within the additional lands,

(b) the effects on the Blairmore system and the customers now served by Calgary Power that the applicant proposes to serve, and

(c) the effects on Calgary Power's operations and the quality of its service in the Blairmore and Crowsnest Pass area.

2.3 Views of the Town of Blairmore

The applicant stated that its primary reason for requesting an enlargement of its service area boundaries to include the arena, curling rink, school area and the nine domestic customers was because the addition of these services would increase the wholesale peak-load demand to the point where additional demand would be charged at a lower rate and this would have the overall effect of decreasing the average wholesale demand charge. The applicant stated that its present peak load was 1 230 kW and presented information to show that it was charged for the twelve months in which the demand was established at the rate of 5 dollars and 35 cents per month per kW for the first 1 500 kW and would be charged 3 dollars and 65 cents per month per kW for the next 7 500 kW if the peak load exceeded 1 500 kW. The charge for energy is 0.57 cents per kWh.

Blairmore further indicated that it is paying Calgary Power retail rates for energy supplied to the arena and curling rink, whereas the energy could be provided at the wholesale rates if the arena and curling rink were supplied by Blairmore's electric distribution system. Blairmore also stated that the rates paid by the school and nine domestic customers would be slightly higher should these services be supplied and billed by Blairmore as proposed in the application.

The applicant stated that, if it acquired the part of the Calgary Power distribution system supplying the additional lands applied for, it would be able to provide adequate service to the existing customers. Blairmore said its present distribution system is served by one full time electrician plus a public works crew that could assist if the need arises, and that this staff could handle the additional services proposed.

2.4 Views of Calgary Power

Calgary Power stated that its primary objection to the granting of the application was the possible effect that this change in service area could have on the operations of Calgary Power in the Blairmore and Crowsnest Pass area now and in the future. Calgary Power expressed concern that the loss of this service area could be followed by the loss of other service areas within the Crowsnest Pass area, with ensuing loss in retail customers, revenue and a possible deterioration in service.

Calgary Power stated that it was providing adequate service in the area proposed for transfer to the applicant, the applicant had staff to maintain only the applicant's existing facilities without the proposed additions, and the savings anticipated were illusory and not based on an adequate study of the costs of the proposed acquisition. It further stated that it maintained a staff of three men in Blairmore to service all the transmission and distribution systems in the Blairmore and Crowsnest Pass area with the exception of the distribution systems operated by the towns of Blairmore and Coleman and the Village of Frank. Calgary Power further contended that, if each municipality were to operate the entire distribution system within its municipal boundaries then it would not be possible for Calgary Power to maintain its present staff and quality of service in the area. Calgary Power also expressed the view that, due to the coincidence of the arena load with the town load in the months of December and January, the applicant might establish a higher 12-month peak load demand and as a result actually pay more, not less, after the proposed changes. In addition the cost less depreciation of the facilities transferred would in Calgary Power's view be some 8,200 dollars and there would be a resultant loss of tax revenue to the town in the amount of approximately 150 dollars per year.

Subsequent to the hearing, Calgary Power supplied more up-to-date figures of the cost of service as requested at the hearing. The first part of the data compared the 1975 Calgary Power retail rate for the "arena" now paid by Blairmore to an estimated wholesale rate which Blairmore would have been expected to pay for the arena should they serve it. The comparison assumed that the arena peak demand would be coincident with the existing wholesale peak demand for Blairmore. Calgary Power pointed out that the arena was billed on Industrial Rate No. 3-770, this rate being somewhat lower than General Service Rate No. 2-256 which had been indicated at the hearing. Calgary Power's data estimated that Blairmore would have been billed a net total of 10 000 dollars under the wholesale rate for the arena as compared to 8 999 dollars actually paid under the retail rate.

The second part of the data compared Calgary Power's retail rate to Blairmore's commercial rate which the Crowsnest Consolidated School would be billed for electric service. Calgary Power's data estimated that the school would be billed 2 035 dollars under the Blairmore commercial rate as compared to 1 408 dollars actually paid under the Calgary Power retail rate in 1975.

Further data also compared the monthly residential rate that the nine domestic services would be billed under the Calgary Power residential rate and the Blairmore residential rate. This data showed that the domestic customer would experience an increase of approximately 12.35 per cent based on an average residential consumption of 500 kWh per month.

2.5 Views of the Nine Residential Customers

Mr. Cousens requested leave to make a late submission after consulting with the other eight residential customers. The participants at the hearing agreed but subsequently Mr. Counsens notified the Board that there would be no submission or further comment.

2.6 Views of the Board

The Board notes that in applications of this type where a local authority wishes to serve additional land within its municipal boundaries there is considerable onus upon the operator whose service area would be reduced to convince the Board, pursuant to section 23 of the Act, that there are compelling reasons in the public interest not to grant the enlargement of service area to the involved local authority. The Board further notes that this type of application cannot in most instances be evaluated in isolation, but the overall effect on the operations of the operator whose service area would be reduced must also be considered. Furthermore, the Board must be satisfied that existing customers of both operators will continue to receive adequate service after any of the proposed alterations of service area boundaries take effect.

Although it is somewhat concerned that Blairmore may not have adequately investigated the economic effects of serving the additional lands applied for, the Board believes that Blairmore could absorb any modest extra cost that might be incurred. There was no objection by existing customers to the change in operation proposed by the town. The Board also expects that the applicant would provide adequate service within the additional lands.

The Board reviewed the economic data presented and found little of significance in the arguments regarding the economic benefits related to the proposed change in service area. The Board believes the economic benefit to Blairmore would be minimal at best, and the economic loss to Calgary Power would not be significant in its overall operations in the Blairmore and Crowsnest Pass area.

The Board has given careful consideration to Calgary Power's argument that, although the alteration applied for is relatively minor, it could lead to similar future applications for alterations that could have a significant effect upon the company's overall operations in the area. The Board expects that, should such future alterations be proposed, Calgary Power might then be in a better position to show how significant such effect might be. The Board does not see any basis for the statement that granting the application before it would lead to similar future applications in the Crowsnest Pass and Blairmore area.

The Board finds no compelling reason in the public interest why it should not grant the application.

3 DECISION

Having regard for its responsibilities under The Hydro and Electric Energy Act, and as more particularly set out in section 23 thereof, the Board is prepared to grant the application of Blairmore for an order enlarging the service area assigned to Blairmore's electric distribution system.

The Board recognizes that the order to be issued to Blairmore will reduce the service area assigned to the electric distribution system of Calgary Power and that a provision in the order for payment of compensation may be suitable. However, the addition of such a provision will be deferred, to give the parties the opportunity of making an agreement as to compensation to be paid. Should the parties be unable to reach agreement with respect to matters of compensation the Board, upon the application of either party, will consider the addition to the order of such a provision.

DATED at Calgary, Alberta on 28 April 1976.

ENERGY RESOURCES CONSERVATION BOARD

GJ DeSorcy

G. J. DeSorcy
Board Member

ENERGY RESOURCES CONSERVATION BOARD
Calgary Alberta Canada

ADDENDUM TO
Decision 76-5
Application No. 8964

TOWN OF BLAIRMORE ALTERATION OF
ELECTRIC DISTRIBUTION SYSTEM

The Board has noted, with respect to its Decision 76-5, dated April 27, 1976, that the document appended thereto as Appendix A was attached in error and should be deleted. A copy of the proper Appendix A is attached to this Addendum and Decision 76-5 is amended accordingly.

ENERGY RESOURCES CONSERVATION BOARD

G J DeSorcy

G. J. DeSorcy, P. Eng.
Board Member

DATED 17 May 1976
Calgary, Alberta

APPENDIX A TO DECISION 76-5

THE PROVINCE OF ALBERTA

THE HYDRO AND ELECTRIC ENERGY ACT

ENERGY RESOURCES CONSERVATION BOARD

IN THE MATTER of the electric
distribution system of the
Town of Blairmore

APPROVAL NO. HE 7211

The Energy Resources Conservation Board, pursuant to section 22 of The Hydro and Electric Energy Act, being chapter 49 of the Statutes of Alberta, 1971, hereby orders as follows:

1. The operation of an electric distribution system of the Town of Blairmore within the service area referred to in clause 2 is approved.

2. The service area of the Town of Blairmore, as of June 1, 1971, is the area shown outlined on the attachment hereto, marked Appendix A.

3. (1) The Board,

   (a) upon its own motion, or

   (b) upon the application of an interested person,

may rescind or amend the approval at any time.

(2) This approval shall remain in effect for a period of twenty years, unless rescinded before that date pursuant to subclause (1).

MADE at the City of Calgary, in the Province of Alberta, this 3rd day of March, A. D. 1972.

ENERGY RESOURCES CONSERVATION BOARD

J. Strong

J. I. Strong
Board Member

ENERGY RESOURCES CONSERVATION BOARD
Calgary Alberta

TRANSMISSION LINE CP 739L
FROM ACHESON TO DEVON

Decision Report 76-6
Application 8770

1 INTRODUCTION

1.1 The Application and Hearing

Calgary Power Ltd., by an application dated 9 September 1975, applied under section 9 of The Hydro and Electric Energy Act for an amendment of Permit and Licence No. CP 75-13 regarding the section of 138 kV transmission line CP 739L between Acheson and Devon.

A public hearing to consider the application was held at the Law Courts in Edmonton on 6 May 1976 with V. Millard, N. Berkowitz, P.Eng. and G.J. DeSorcy, P.Eng. sitting.

THOSE WHO APPEARED AT THE HEARING

Principals and Representatives (Abbreviation Used in Report)	Witnesses
Calgary Power Ltd. (Calgary Power)	
H. M. Kay	E. J. MacLeod, P.Eng. R. F. Bell, P.Eng. E. J. Limoges R. E. Keyes, P.Eng. C. R. Hoar, P.Eng.
Mr. and Mrs. M. Berretti Keith Oberle D. Evans Neil Weir Collin Mathewson John Whitehead Donald G. Bittorf Jack Ondrack Peter Allen Mr. and Mrs. M. M. Dixon Mr. and Mrs. J. Thompson	
Francis C. R. Price	

THOSE WHO APPEARED AT THE HEARING - Continued

Mr. Andy Melton

Andy Melton

Mrs. Ann Kapty

Ann Kapty
Fred Kapty

Miss Donna Wright
Mrs. Elizabeth Latimer

Donna Wright

Mrs. Kathleen Oberle

Kathleen Oberle

Mr. Leo Borchert

Leo Borchert

Energy Resources Conservation Board (Board staff)

A. L. McLarty
W. L. McVeigh

Sunwapta Broadcasting Limited had intervened, however Mr. M. D. MacDonald appeared at the hearing and withdrew Sunwapta's objection. Orest and Patricia Workun had also intervened, but they were not represented at the hearing.

1.2 Background

Permit and Licence No. CP 75-13, with respect to transmission line CP 739L between Stony Plain and Devon, was issued by the Board following its approval of Applications No. 7823, 7869 and 7913, which were heard at a public hearing on 22 October 1974. Application No. 7913 concerned the Acheson to Devon section of the proposed line, and the applicant's preferred route at that time was the same as its preferred route in the current application, No. 8770. The Board, however, in approving Application No. 7913 approved the alternative route indicated in Figure 1 for the reasons set out in Board Decision No. 75-7.

Subsequent to the issuing of Permit and Licence No. CP 75-13, Alberta Government Telephones (AGT) indicated to Calgary Power that it would not approve the construction on the route required by the Board, since a transmission line on that route could induce voltages on an adjacent buried communication cable, resulting in continuous electrical noise under normal conditions, and in dangerously high voltages under electrical fault conditions. According to AGT, the type and age of the cable prevented relocating the cable itself to reduce the induction problem.

Calgary Power, by Application No. 8716 dated 13 August 1975, applied to the Board to amend Permit and Licence No. CP 75-13 to allow Calgary Power to build on its preferred route. The Board denied this application, but indicated it would consider a new application if at least one alternative route was submitted.

Application No. 8770, dated 9 September 1975, was submitted with one alternative route. In a letter dated 15 October 1975, the Board requested that a second alternative route be considered. The applicant supplied some supplementary material, including the second alternative route, in a submission dated 4 February 1976.

Since a number of parties had objected to Application No. 7913, the Board decided to consider Application No. 8770 at a public hearing which was held on 6 May 1976. During the hearing the Board staff requested that a post-hearing technical meeting be held to discuss certain aspects of the applicant's visual and land-use impact assessment. There were no objections to this procedure and a meeting was held on 19 May 1976 in the Board's Calgary office.

1.3 The Application

The application proposes the construction of a 138 kV transmission line from Acheson Substation CP 305S to Devon Substation CP 14S. Three possible routes were submitted by Calgary Power as follows: (the letters refer to Figure 1)

Route 1: ABGHCF

Route 2: ABGKMCF

Route 3: ANOLMCF

Routes 1 and 2 were the applicant's preferred and alternative route respectively, while Route 3 was the alternative that the Board requested be considered. On Figure 1, Routes 2 and 3 are marked separately only where they differ from Route 1.

Routes 1 and 2 both parallel Highway No. 60 through the Stony Plain Indian Reserve, then diverge in the area between the Reserve and the North Saskatchewan River. Route 3 follows the route of existing 69 kV lines along the north and east boundaries of the Reserve, and south to point M near the river. Routes 2 and 3 join Route 1 at point C and all three follow the same alignment across the river to Devon Substation CP 14S.

2 DEFINITION OF ISSUE

During the Board's consideration of Applications No. 7823, 7869 and 7913, there was considerable discussion of the need for transmission line CP 739L. Further, with respect to Application No. 8770, the applicant indicated at the hearing that the need had become more urgent, and none of the intervenors disagreed. The Board therefore believes that the need for the line has already been established, and considers the location of the transmission line to be the major issue.

3 THE LOCATION OF THE TRANSMISSION LINE

3.1 Views of the Applicant

Calgary Power submitted Route 1 as its preferred route and Route 2 as its alternative. At the Board's request Route 3 was also included as an alternative route. The applicant compared the three routes on the basis of several criteria including cost, residential impact, land-use impact, visual impact, reliability of supply, and location with respect to the service area. Section C to F was not included in the comparisons because it is common to all three routes. A more detailed description of the applicant's ranking of the routes follows.

Shown below are Calgary Power's estimated actual costs for each route (rounded off to the nearest thousand).

Route 1 - $301 000

Route 2 - $381 000

Route 3 - $523 000

The differences in costs were mainly the result of the different lengths of each route, the number of existing circuits on each route and the number of customers affected by construction on each route. Route 1 was 10.5 miles long, Route 2, 12.5 miles and Route 3, 14.5 miles. This resulted in Route 3 costing more than Route 2 which in turn would cost more than Route 1. In comparison to Route 1 there were, on Route 2 and, in particular, on Route 3, greater portions of the line where a second three-phase circuit would have to be strung. This would result in increased costs of material and construction labour because of a greater number of longer poles, as well as additional cross-arms and conductors. Calgary Power indicated that, to keep disruptions in service to existing customers at a minimum during construciton, it would take measures which would result in additional costs. Route 2 and Route 3 were shown to have considerably more customers than Route 1.

To determine the visual impact of the line on residents in the area, the applicant prepared a residential impact assessment which would usually be based on the existing housing density per mile. In this case the applicant has, in recognition of the evidence that the whole area would be subdivided at some time in the future, based this impact assesment on the total length of each route. On this basis the ranking from least to greatest impact was Route 1, followed by Route 2, followed by Route 3.

Calgary Power assessed the interference of the line with the use of land, and the visual impact of the line on persons travelling on roads in the area. These assessments were referred to as the land-use impact and the visual impact respectively. Following the post-hearing technical meeting, the applicant submitted some corrected tables relating to these two assessments. The assessment of the visual impact rated the three routes according to the line structure type and the quality of the screening or background provided by the trees along the route. The land-use assessment was based on the line being located on the road allowance and did not distinguish between the line structure types. The two individual assessments were combined with the conclusion that there was no significant difference between the three routes with regard to overall visual and land-use impact.

Calgary Power expressed much concern regarding its ability to maintain an alternative supply to the Imperial Oil Gas Plant at Devon. At the present time the gas plant can be supplied through Devon Substation CP 14S by CP 739L from Nisku, or by CP 75L from Jasper Place. If Route 2 or Route 3 were selected, three or ten miles, respectively, of the 69 kV transmission line CP 75L would have to be rebuilt for 138 kV service. Calgary Power said that during that time it would not have an alternative supply to the gas plant without expending a considerable amount of money. Thus for reliability of supply to the gas plant, the applicant considered Route 1 preferable to Route 2 and much preferable to Route 3.

According to the applicant, Route 1 is located in the centre of the electrical load in this area, and would facilitate the construction of substations to supply future load growth. In this respect the locations of Route 2 and Route 3 would not be as advantageous.

As a result of its comparisons using the various criteria, Calgary Power stated its preference for Route 1. It also referred the application to several government departments and local agencies. The rankings of the three routes by each of these groups, based on its own particular criteria, are shown below. The applicant said that AGT, although stating a preference for Route 3, had indicated that any of the three routes would be acceptable.

AGENCY	RANKING (in descending order of preference)
Alberta Environment	1, 2, 3
Edmonton Regional Planning Commission	2, 1, 3

Table - Continued

Alberta Transportation	3, 1, 2
Alberta Government Telephones	3, 1, 2
County of Parkland	1, 2, (3 not rated)

In answer to a question by the Board staff, the applicant said that the unopened road allowance west of 14-52-26-W4M was closed to vehicular traffic by county bylaw. The applicant indicated that it understood the road allowance was available for utility use and noted that a pipeline had recently been constructed on it.

In reply to a question by Mr. Price, the applicant said that no routes were proposed west of Highway No. 60 because any routes there would be longer than Route 1. In the application it had also stated that construction on these routes would be difficult because of the amount of water and swamp in the area.

With regard to AGT's power to prevent the construction on the route approved by Permit and Licence No. CP 75-13, Calgary Power noted that Section 31 of The Hydro and Electric Energy Act requires an operator to obtain AGT approval before starting construction. AGT did not give its approval, so the applicant was precluded from building the line.

3.2 Views of the Intervenors

Mr. Price, representing a group of property owners on Route 1, and Mrs. Kapty, Miss Wright and Mrs. Oberle, property owners on Route 1, all objected to the line being constructed on Route 1. A common source of concern was that the line would have a negative aesthetic impact on the area, which the intervenors described as being wild and natural. They questioned the effect of the line on wildlife and the amount of tree clearing that would be required. Mr. Price, Mrs. Kapty and Miss Wright said the transmission line would make the land less desireable for subdivision, thus decreasing the value of the land. Mr. Price suggested that the area adjacent to Route 2 had been opened up more than that adjacent to Route 1 so the aesthetic impact of the line on Route 2 would not be as great.

Miss Wright and Mrs. Oberle said that the line would be very close to some houses, and therefore they were worried about safety as regards such things as lightning strikes. Mrs. Kapty and Miss Wright also questioned the effect of the line on television reception.

Mr. Price and Mrs. Kapty had concerns regarding AGT. The former wondered why AGT had been able to preclude Calgary Power from constructing a line adjacent to Highway No. 60 as had been approved by the Board following Application No. 7913. The latter questioned the possibility of the induced voltage from the transmission line similarly affecting the AGT buried cables along Route 1.

Mr. Price asked if routes west of Highway No. 60 had been considered for the present line, and further asked, if the present line were constructed, how many miles west would the next major line be located in the future. Mr. Kapty, representing Mrs. Kapty, said that the road adjacent to her property was to be widened and asked if a line following Route 1 would be constructed on the existing road allowance or would take into consideration the road widening.

Mr. Melton's property was located on both Route 2 and Route 3, and he expressed the concern that the aesthetic impact of the transmission line would decrease the value of his land. He suggested that since Route 2 was longer than Route 1 it would have correspondingly more impact. His other concerns were telephone interference and the possibility of underground construction to reduce the line's visual impact.

Mr. Borchert, who was located on Route 3, said he had three gas lines on his property and an existing transmission line adjacent to it. He questioned how much additional land would be required for the proposed line.

3.3 Views of the Board

Both the intervenors and the applicant expressed the opinion that there would be considerable further subdivision of the area between Acheson and Devon. The Board agrees with the intervenors that the visual impact of the transmission line might lower the subdivision value of lands adjacent to the line; however, it also agrees with the applicant that there is a need for the transmission line as an alternative source of supply of electrical energy to this area.

The Board notes that there seemed to be some confusion at the hearing with regard to where the line would be located with respect to the road allowances. The application is clear that on any of the routes the line would be on the road allowance, two feet from the eastern boundary on north-south sections, and two feet from the northern boundary on east-west sections. Also, any existing poles would be removed where necessary, and the existing conductors re-strung as a second circuit on the proposed line. The Board also notes that at the hearing, the applicant, in answer to a question by Mr. Kapty, said that where road widening is planned the initial location of the line would be negotiated with the landowner involved.

The Board believes that the visual and land-use impact, the economic cost and the effect on reliability should be the bases for selecting the most suitable route.

The Board has examined the detailed visual and land-use impact assessments submitted by the applicant and agrees with the conclusion that there is no significant difference in the overall impact of each of the three routes. The Board considers assessments of this type to be worthwhile, but recognizes that a certain period of development will be necessary to reduce their subjectiveness.

The Board agrees with the cost estimates submitted by the applicant for each of the routes. The estimates show that Route 1 is less costly by some $80 000 than Route 2 and some $225 000 than Route 3.

With respect to reliability, the Board believes that Route 1 has the advantage of being nearest the probable future load centre, and avoids the difficulty of providing alternative electric energy supply to the Devon Gas Plant during the construction period.

Having regard for the similar visual and land-use impact of each of the three routes, and the lower cost and increased reliability of Route 1, the Board concludes that Route 1 is more acceptable than either of the other two routes.

A certain amount of tree clearing could result from the construction of the line, however the Board notes that, at the request of the land owner involved, Calgary Power will trim trees where possible rather than remove them completely. This care in clearing is of particular importance with respect to the pine trees mentioned by Mrs. Oberle. The line, and particularily the construction of it, could also affect wildlife in the area, however the Board believes these effects would be of a transient nature only.

Regarding electrical safety, and also the effect of the line on telephone communications and television reception, the Board is satisfied that the line would be constructed to conform with the appropriate standards.

4 DECISION

Having regard for its responsibilities under The Hydro and Electric Energy Act, and, subject to the approval of the Deputy Minister of the Environment and the Deputy Minister of Energy and Natural Resources insofar as matters of the environment are concerned, the Board is prepared to issue a revised permit and licence for the construction and operation of a 138 kV transmission line, designated CP 739L, on Route 1 as described in section 1.3 and shown on Figure 1.

DATED at Calgary, Alberta on July 23, 1976.

ENERGY RESOURCES CONSERVATION BOARD

Vernon Millard

Vernon Millard
Vice Chairman

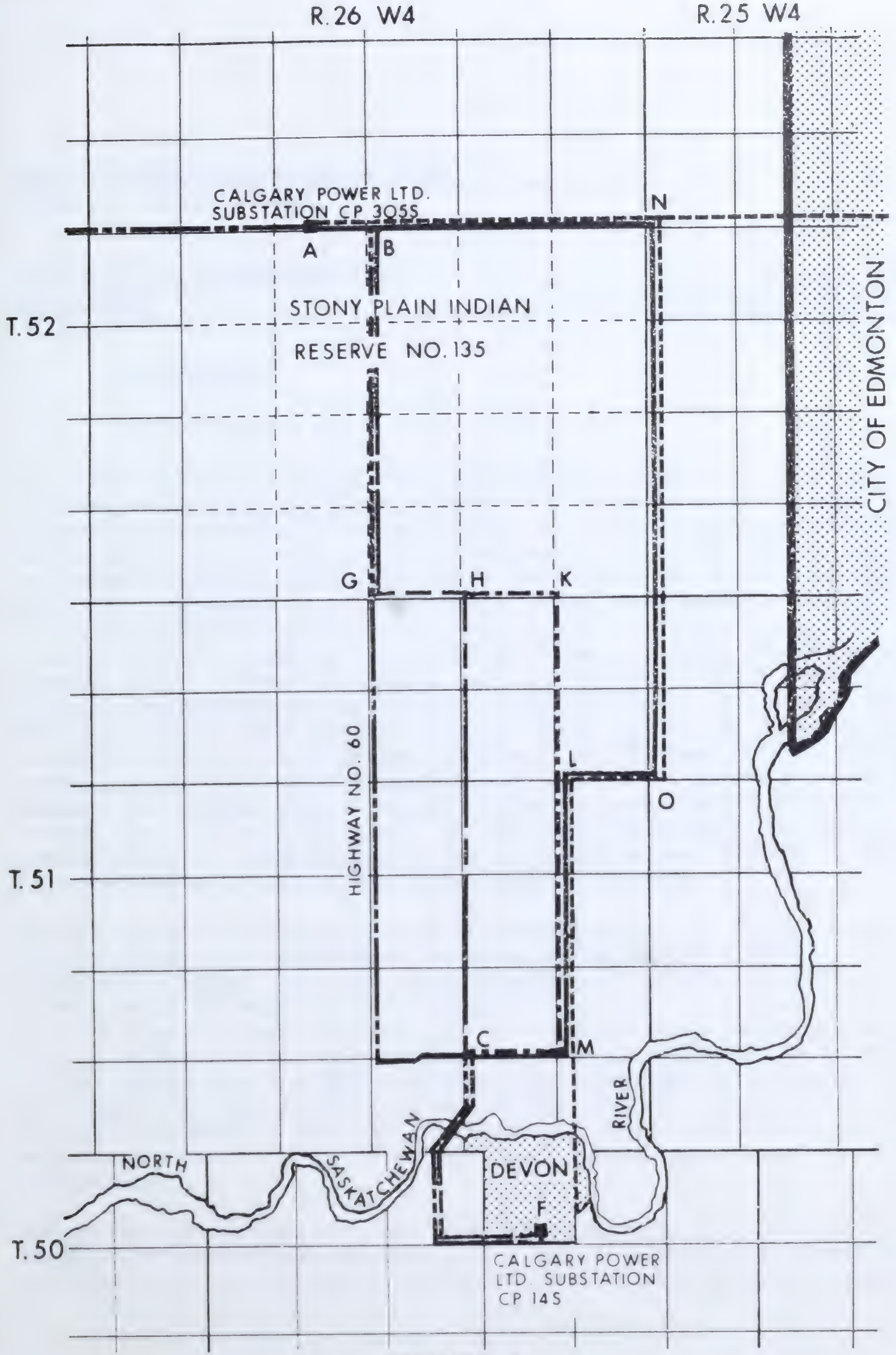


FIGURE 1

ROUTE SET OUT IN PERMIT AND LICENCE NO. C.P. 75-13 FOR 138 KV TRANSMISSION LINE
ROUTE 1 - PREFERRED BY CALGARY POWER LTD.
ROUTE 2 - ALTERNATIVE
ROUTE 3 - ALTERNATIVE
EXISTING 69 KV TRANSMISSION LINES

ENERGY RESOURCES CONSERVATION BOARD
Calgary Alberta Canada

ROCHFORT RURAL ELECTRIFICATION ASSOCIATION

Decision 76-7
Application No. 9389

1 INTRODUCTION

1.1 The Application and Hearing

The Rochfort Rural Electrification Association Limited (REA) owns and operates an electric distribution system for the purpose of distributing electric energy to its 72 active members in the area shown in Figure 1. The operation of the system within its prescribed service area is authorized by Energy Resources Conservation Board Approval No. HE 75115. The REA is party to an agreement with its operating agent, Farm Electric Services Ltd. (a subsidiary of Calgary Power Ltd.), and with Calgary Power Ltd., whereby the REA's billing, accounting and other operating procedures are carried out by its operating agent and Calgary Power. The REA purchases wholesale energy from Calgary Power for distribution to the members of the REA, and Calgary Power staff in the area carry out the day-to-day physical operation of the electric system. Although the REA owns its distribution system and has the exclusive right (under Approval HE 75115) to serve its members, its service area is wholly within the larger service area of Calgary Power and this has led to the operating arrangement whereby the company supplies wholesale energy and its staff become involved in many facets of the operation of the system owned by the REA.

The REA applied to the Board under sections 23 and 24 of The Hydro and Electric Energy Act for approval to cease operating its electric distribution system. The REA indicated that part of its system is in need of repairs which would cost in the order of $57,000. It stated that it does not have the funds necessary to repair or maintain the system and in fact as of December 31, 1975 its deposit account had a negative balance. The REA stated that the "Board of Directors is opposed to assessing the members for funds in the magnitude required for the immediate repairs and replacements. It is also opposed to assessing the members for additional funds in the magnitude required to provide a reserve for future system repairs and replacements."

The application was heard by the Board in Mayerthorpe on 28 June 1976. The Board issued a brief interim report on 5 July 1976 wherein it agreed that the repair work was essential and should be undertaken as soon as possible.

THOSE WHO APPEARED AT THE HEARING

Principals and Representatives (Abbreviation Used in Report)	Witnesses
Rochfort Rural Electrification Association (Rochfort REA) H.A. Bodner, Q.C. D. Lynass	E.E. Carlson E. Mattson
Farm Electric Services Ltd. (FESL) H.M. Kay	W. Smith, P. Eng. W.D. Poole, P. Eng. W. Wills
Calgary Power Ltd. (Calgary Power) H.M. Kay	E.W. Smith, P. Eng. D. Lyons, P. Eng.
Union of Rural Electrification Associations Limited (Union of REA's) C. Farrar C. Westby	C. Westby
Colinton Paxson Rural Electrification Association (Colinton Paxson REA) T. Lund C. Alberts	
Group of 9 Members of the Rochfort REA J. Springer	J. Springer
Rural Power and Gas Co-op Branch of the Alberta Department of Consumer and Corporate Affairs J. Mann	J. Mann

1.2 The Interventions

FESL described its contractual relationship to the Rochfort REA as well as its operating and billing procedures and indicated that the deposit account of the Rochfort REA was in a negative balance position of some $1,700 as of 31 December 1975. FESL presented evidence indicating that part of the Rochfort REA is in very poor physical condition and that the cost of necessary repairs would be some $57,000.

Calgary Power stated that it is aware of the condition of the Rochfort REA and that it does not oppose the ceasing of operations of the REA. It did indicate that it was not prepared to take over financial responsibility for the REA in its present condition. Calgary Power said that if the Rochfort REA system were brought up to standards it would be prepared to purchase the system and continue its operation. It estimated that it would pay approximately $20,000 for the system after repairs. Calgary Power said that the value of the system to it was based on the incremental revenue it would generate for Calgary Power in future as compared to projected expenditures for maintenance and repairs.

The Union of REA's expressed concern at the prospects of the Rochfort REA passing into the hands of a private power company. It said that all REA's in the province pooled their operating costs and as many members as possible should remain part of the pooling arrangement. The Union of REA's questioned FESL and Calgary Power at length respecting the present worth of an REA system. It also questioned the Rochfort REA as to whether it had investigated all available methods of obtaining money for the needed repairs. The Union of REA's suggested that a decision on the subject application could be delayed until further input to elected representatives was possible.

The Colinton Paxson REA pointed out to the Board that the handling of the subject application would set a precedent with respect to other REA's which are in a similar predicament to that of the Rochfort REA.

A group of members of the Rochfort REA objected to the application and stated that the REA could continue operations by making an additional financial levy against early members of the REA who had originally paid less than certain members who joined the REA in more recent years.

2 ISSUES

In dealing with the subject application the Board considers the issues to be as follows:

(a) What is the physical condition of the Rochfort REA distribution system and can it provide a reliable supply to members of the REA?

(b) The desirability in the public interest of the Rochfort REA being permitted to cease operations.

(c) Who would take over the operation of the distribution system if the REA ceases to operate it and what would be the terms and conditions of a takeover?

(d) What would be the mechanics of implementing the Board decision?

2.1 Physical Condition of the Rochfort REA

As stated in its Interim Decision Report, the Board is satisfied that some of the distribution facilities of the Rochfort REA are in extremely poor physical condition and represent a serious hazard both to the public and to those who operate the facilities.

The part of the system most urgently in need of repairs consists of approximately five miles of the original distribution line which was installed on substandard quality poles in about 1951. Some 116 poles now require replacement. The line must be resagged to provide proper clearance and two circuit reclosers should be installed. The Board is generally satisfied with the estimated cost of $57,000 as made by FESL. The Board believes that unless these repairs are made immediately there is a high probability that winter storms will result in REA members being without electric energy for an extensive period of time.

2.2 Ceasing to Operate the Rochfort REA

The Board accepts the evidence of the officers of the Rochfort REA that it "wants out" of the electric distribution function even if the immediate financial problem could be solved. It appears clear to the Board that the REA should have the right to decide to cease its operations notwithstanding the opposition to the application by the Union of REA's. The Rochfort REA is not a member of the Union and the sale of its system to Calgary Power would not represent a precedent since several other REA's have already sold their systems to the utility companies.

Furthermore, having regard for the fact that the Rochfort REA's deposit account was in a negative position at the end of last year, the fact that repairs of $57,000 are immediately required for the system, the age of the remainder of the distribution system, the increase in the monthly reserve payment that would be necessary to bring the deposit account into a reasonable balance so that other repairs and replacements could be made in the future, and the overall problems of managing the REA distribution system, the Board concludes that it would be in the public interest for the REA to cease to operate.

On the basis of the application and the above views regarding the public interest, the Board concludes that the Association should cease to operate its distribution system and accordingly the Board will rescind Approval No. HE 75115.

Although the Board has received no communication from the applicant since the hearing, it understands that the Rochfort REA may be reconsidering its previous decision. In the event that the REA decided that it wished to resume operations, it could apply for a cancellation of the rescinding order. The Board would expect to receive evidence that reinstatement of the system would be in the public interest and in particular details respecting the method of managing and financing the system. The latter would include the financing of the currently required repairs and the future repairs and replacements which will be required.

2.3 The Transfer of the REA Distribution System

The effect of rescinding the Rochfort REA service area would be to place the area in the Calgary Power service area. Calgary Power, through its subsidiary FESL, currently operates the distribution system on behalf of the REA and also supplies the electric energy on a wholesale basis to the REA. For these reasons the Board believes it is logical that the operation of the REA distribution system be transferred to Calgary Power.

Evidence at the hearing indicated that there are two basic difficulties in the parties reaching agreement on a transfer of the system. Calgary Power is prepared to purchase the system provided that the repairs are made before purchase in order to bring the system up to an acceptable level. The REA does not have the necessary funds to make the repairs nor is it prepared to assess its members for the $57,000. In addition, several members appear dissatisfied with the purchase price offered by Calgary Power.

As stated previously, the Board is in general agreement with the estimated repair costs. With respect to the purchase price, the Board recognizes that it is not expert on rate matters but having regard for the concern of the REA members it has considered on a broad judgement basis the appropriateness of the Calgary Power estimate. Calgary Power indicated that its purchase price formula compares the estimated future costs for maintenance and replacement to the incremental revenue which would accrue to Calgary Power due to the difference in farm and REA rates established by the Public Utilities Board. It said that in the case of the Rochfort REA the purchase price determined in this manner would be some $20,000 assuming that the $57,000 of repairs had been made. Following the hearing the Board obtained additional information from Calgary Power respecting the method of determining the purchase price. It appreciates that Calgary Power endeavours to determine the purchase price for an REA system in such a manner as to neither benefit nor prejudice the interests of the other farm customers in the Calgary Power system. The Board subscribes to this objective but in this particular instance is not completely satisfied that the objective is accomplished. In the Board's view, the parties should attempt to negotiate a purchase price. If a price cannot be agreed to the matter could be referred to the Public Utilities Board. In the Board's view the Public Utilities Board is the appropriate body to determine the purchase price of the distribution system and also to adjudicate on the question of how the $57,000 should be allocated. Providing that the two parties can agree that they are prepared to transfer the system from the REA to Calgary Power then Section 23(4) of The Hydro and Electric Energy Act provides a means of determining compensation and for referral to the Public Utilities Board.

2.4 Mechanics of Implementing the Board Decision

In summary, the Board considers it in the public interest that the Rochfort REA cease to operate and that system and its operation be transferred to Calgary Power. How could this best be accomplished? The Board believes that the following sequence provides a basis for proceeding.

1. Coincident with the release of this report the Board will issue an Order cancelling the service area of the Rochfort REA effective 22 September 1976.

2. The Board will meet with representatives of the Rochfort REA and Calgary Power shortly after the release of this report to explain more fully the Board's thinking on the matter.

3. The Rochfort REA and Calgary Power will have until 21 September 1976 to negotiate:

   (a) an agreement for the sale and transfer of the system, in which case no further action by the Board would be required;

   (b) an agreement for the transfer of the system subject to the Board determining the matters in respect of which compensation is payable, and thereafter, if a satisfactory price cannot be resolved, the amount, on the application of either party, may be determined by the Public Utilities Board; or

   (c) an agreement for the temporary use of the REA facilities which would allow the continued service of REA customers by Calgary Power.

4. The Board should be informed of the status of negotiations as of 21 September 1976.

   (a) In the event that a complete agreement is reached Calgary Power would simply take over the system on the effective date of the Order.

   (b) In the event that an agreement for the transfer of facilities is reached but the parties cannot agree on the financial aspects, the Board would likely amend its Order, and in accordance with section 23, subsection (4) of The Hydro and Electric Energy Act, would make provision for payment of compensation respecting the transfer of the system to Calgary Power. This would automatically mean that if agreement on the amount of compensation cannot be reached between the parties, the Public Utilities Board would determine the amount on the application of either party.

(c) In the event that the parties are unable to reach any agreement by 21 September 1976, the Board's action at that time would depend on the existing circumstances. For example, if the information provided the Board indicated that an agreement would likely be reached in the near future and that additional time was needed, the Board would be prepared to amend its Order extending the effective date. On the other hand, however, if good progress were not being made towards an agreement the Board might approach the Public Utilities Board and request that it issue, under section 81, subsection (1) (e) of The Public Utilities Board Act, an order to Calgary Power to serve the customers now in the Rochfort REA. The effect of such an order would be to place Calgary Power in the position of either supplying the REA customers through the purchase of the existing system or by the construction of a new system. The Public Utilities Board could determine the rates and the rate base which would be applicable to the REA customers.

(d) In the event that the Rochfort REA changes its position and wishes to retain ownership and operation of the system, it would have to apply to the Board for rescission of Approval No. HE 75115. As mentioned earlier, it would have to satisfy the Board that it intends to adequately manage the system and that reinstatement of the REA was in the public interest.

5. If an agreement were made, either as in (a) or (b) above or as in (c) following an order from the Public Utilities Board, Calgary Power would take over operation of the system on the effective date of the Board Order and should proceed immediately towards making the necessary repairs. The funds would be provided by Calgary Power on the understanding that reimbursement would be made in accordance with the financial arrangements as finally agreed to or as stipulated by the Public Utilities Board. If an agreement cannot be reached, Calgary Power would not have ownership of the system and could not proceed with the necessary repairs unless authorized to do so by the owners of the system. The repairs would nevertheless still be required and the Rochfort REA would have to accept financial responsibility for them.

3 DECISION

The Board is prepared to grant the application of the Rochfort REA and is issuing an Order rescinding Board Approval No. HE 75115 effective 22 September 1976.

DATED at Calgary, Alberta on 27 August 1976.

ENERGY RESOURCES CONSERVATION BOARD

Vernon Millard
Vice Chairman

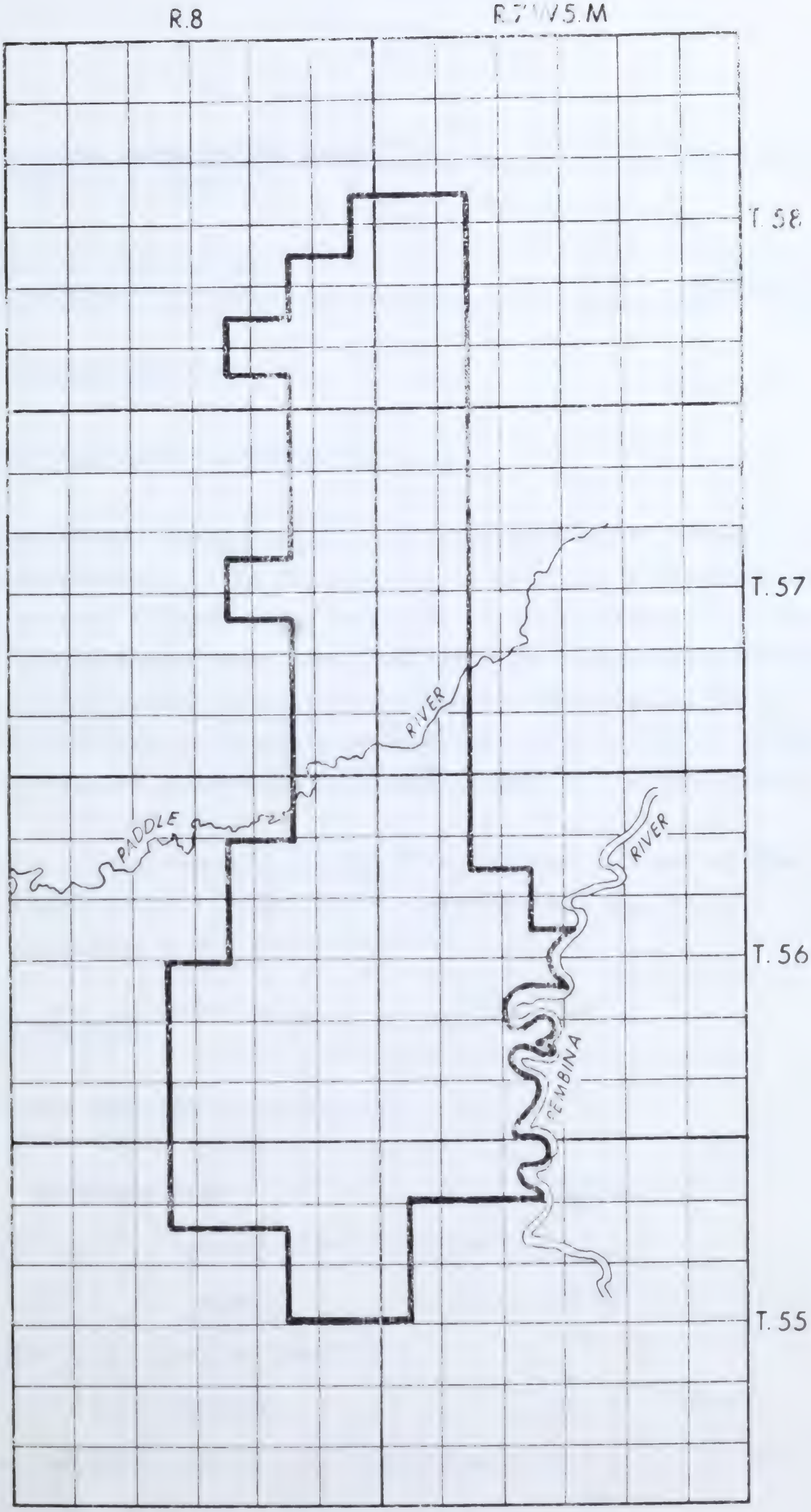


FIGURE 1 ROCHFORT RURAL ELECTRIFICATION ASSOCIATION LIMITED SERVICE AREA

ENERGY RESOURCES CONSERVATION BOARD
CALGARY ALBERTA

ENERGY RESOURCES CONSERVATION BOARD
Calgary Alberta Canada

NORTH CANADIAN OILS LIMITED
WABAMUN LAKE AREA

Decision 76-8
Application 9164

1 INTRODUCTION

1.1 The Application and Hearing

North Canadian Oils Limited applied on February 27, 1976 pursuant to Part 4 of The Pipeline Act, 1975 for a permit to construct a secondary line for the transmission of natural gas consisting of 7.5 miles of 2.375-inch diameter aluminum pipe from North Canadian Oils Limited gas transmission line; at the North-east quarter of Section 18, Township 53, Range 6, West of the 5th Meridian, to the Langley Peat Ltd. plant in the North-east quarter of Section 7, Township 52, Range 6, West of the 5th Meridian.

The application was heard by the Board in Edmonton, Alberta on June 1, 1976 with D.R. Craig, P. Eng., Dr. N. Berkowitz, P. Eng. and V.E. Bohme, P. Eng. sitting.

1.2 Appearances

The following appeared at the hearing:

	Represented by	Witness
North Canadian Oils Limited (North Canadian)		
	Mr. T. H. Ferguson	Mr. W. K. Miller, P. Eng.
Langley Peat Ltd. (Langley Peat)		
	Mr. P. G. Ponting	Mr. E. Rive
Evergreen Gas Co-op Ltd. and The Federation of Alberta Gas Co-ops Ltd. (Gas Co-op)		
		Mr. D. M. Jouan Mr. H. J. Tomlinson

Energy Resources Conservation Board (Board Staff)

Mr. L. A. Bellows, P. Eng.
Mr. S. Collins
Mr. A. L. McLarty

Note: Abbreviations shown in parentheses are used in this report.

2 DEFINITION OF ISSUES

The Board considers the issues of this application to be:

1. The route selection of the proposed pipeline, and
2. The existence of an exclusive franchise to supply gas to the applicant.

3 VIEWS OF THE APPLICANT

The applicant stated that Langley Peat approached North Canadian to supply natural gas by August 1, 1976 for its peat drying operation, thus necessitating the construction of a pipeline from an existing North Canadian gas transmission line to the Langley Peat plant. The plant is currently under construction with start-up scheduled for September 1, 1976. North Canadian stated that the route selected was the most direct from the North Canadian pipeline to the plant and that the pipeline size was based upon future requirements of both Langley Peat and the Gas Co-op. North Canadian submitted a letter from Alberta Utilities and Telephones which authorized it as a distributor, to market gas in the Evergreen Gas Co-op area. North Canadian contended it was not the intent of The Rural Gas Act to establish an exclusive franchise for the rural gas co-ops.

4 VIEWS OF LANGLEY PEAT

Langley Peat stated that a source of gas was required for its peat drying operation at the plant. It had entered into an agreement with North Canadian to supply gas to the plant by August 1, 1976 for plant start-up on September 1, 1976. Langley Peat further stated that the selection of a gas supplier was based on a need to obtain a reliable gas supply by an

August first deadline and the expectation that the cost of the gas would be reasonable. If the Gas Co-op were able to meet the deadline and assure reliability and competitive prices, Langley Peat would also consider it as a potential supplier.

5 VIEWS OF THE GAS CO-OP

The Gas Co-op submitted that its function is to efficiently serve its customers within the franchise area with a reliable source of natural gas. The Gas Co-op submitted a proposed route for a pipeline to serve Langley Peat which would also better serve the needs of the rural gas consumers in the area and result in a saving of public monies. The Gas Co-op contended that the Evergreen franchise area was exclusive to them, and that it had a right to supply the larger, more profitable customers as well as a duty to serve the small, remote, less economic farm customers.

6 VIEWS OF THE BOARD

The Board agrees that a need exists for a pipeline to supply gas from the North Canadian transmission line to the Langley Peat plant. The Board notes, based on the submissions of the applicant and the Gas Co-op, that both proposed pipeline routes would serve the needs of the rural gas consumers in the immediate area as well as the Langley Peat plant. The Board concludes, from evidence presented at the Hearing, that the relative economics of transporting gas to the Co-op area and to the peat plant are reasonably similar for both the applicant's case and the alternate proposed by the Gas Co-op. Accordingly, the Board considers it reasonable that the final business decision for selection of the route for the line should be that of the builder of the line and purchaser of the gas, in this case Langley Peat.

In the Board's opinion the Gas Co-op's contention that its franchise for the area is exclusive appears unwarranted, since consent was granted under The Rural Gas Act by the Minister of Utilities and Telephones for North Canadian to supply gas within the Gas Co-op area. Further, the issuance by the Board of a permit to construct the proposed pipeline would not determine the legality of the franchise granted under The Rural Gas Act. The Gas Co-op also has the right to make an application to the Board for a permit for its propsed line, and the Board would be prepared to issue the permit if the need was demonstrated, either by the existence of an agreement between the Gas Co-op and Langley Peat, or otherwise.

7 DECISION

The Board is prepared to grant the application of North Canadian and will issue a permit for the construction of the proposed 2.375-inch diameter, 7.5-mile pipeline for the transmission of natural gas from the North Canadian gas transmission line to the Langley Peat plant.

ENERGY RESOURCES CONSERVATION BOARD

for D.R. Craig
Vice Chairman

DATED July 6, 1976
Calgary Alberta

ENERGY RESOURCES CONSERVATION BOARD
Calgary Alberta Canada

COMMINGLING IN THE MEDICINE HAT FIELD

Decision 76-9
Application No. 8981

1 INTRODUCTION

1.1 THE APPLICATION AND HEARING

M-P Petroleum Limited applied pursuant to section 3.050 of the Oil and Gas Conservation Regulations for approval of:

(a) the Milk River, Medicine Hat and Lower Medicine Hat Formations in six sections of the Medicine Hat Field, and

(b) the Milk River and Lower Medicine Hat Formations in 31 sections of the Medicine Hat Field,

as pools from which production may be taken without segregation in the well bore. The area of application is shown in Figure 1.

An intervention to the application was received from Pembina Pipe Line Ltd.

The application was the subject of an examiners' hearing on 2 March 1976 with H. J. Webber, P. Eng., V. E. Bohme, P. Eng., and J. R. Pow, P. Eng., sitting.

THOSE APPEARING

Principal (Abbreviations Used in Report	Representatives
M-P Petroleum Ltd. (M-P)	W. Sharp, P. Eng. R. D. Weir, P. Eng.
Pembina Pipe Line Ltd. (Pembina)	W. Hunka, P. Eng.
Energy Resources Conservation Board (Board Staff)	R. L. Archibald, P. Eng. G. S. Brar, P. Eng. P. D. Watson, P. Geol.

1.2 GEOLOGICAL TERMINOLOGY AND POOL IDENTIFICATION

A commingling order, in compliance with section 3.050 of the Regulations, must apply to pools rather than formations or zones. Thus, the relationship between the formation under application and the pools affected thereby is described below:

The "Milk River Formation" referred to in this report contains the Medicine Hat Milk River A Pool throughout the area of application.

The "Medicine Hat Formation" and the "Lower Medicine Hat Formation" discussed in this report correspond to the two stratigraphic units referred to by those names in the Notice of Hearing, in the first paragraph of the applicant's submission and in the intervener's submission. (Elsewhere in the applicant's submission, the "Medicine Hat Formation" and the "Lower Medicine Hat Formation" are referred to as the Medicine Hat A and B zones, respectively).

Figure 2 shows the stratigraphic positions of the latter two zones and their relationship to the Medicine Hat Medicine Hat A and B Pools as designated by Board Order No. G 1964.

This figure indicates that:

(a) The "Medicine Hat Formation" contains the subsisting Medicine Hat Medicine Hat A Pool and the uppermost gas-bearing sand in the Medicine Hat Medicine Hat B Pool, and

(b) The "Lower Medicine Hat Formation" contains the lowermost gas-bearing sand in the Medicine Hat Medicine Hat B Pool.

1.3 PREVIOUS DECISION AND ORDER

In Decision 73-20 the Board approved, in principle, the commingling of the Milk River, Medicine Hat and Lower Medicine Hat Formations in Southeastern Alberta but stated that an application would be required for any specific area and that each application would be considered on its own merits. All areas within the Medicine Hat Field where commingled production of two or more pools has been approved are delineated in Board Order No. MU 133.

2 DEFINITION OF ISSUES

The main issue is whether the granting of the application would affect the rights of the intervener in the area of application. In this regard, there are two specific concerns:

(a) whether the commingling of production from the Milk River and Lower Medicine Hat Formations in Area II, shown by Figure 1, would cause drainage from the Medicine Hat Formation and, if so, whether the drainage would be greater than that which would occur if the Milk River and Lower Medicine Hat Formations were produced separately, and

(b) whether it is appropriate to grant the application to commingle production from the Milk River, Medicine Hat and Lower Medicine Hat Formations in those four sections of Area I, also shown by Figure 1, where the intervener holds rights to the Medicine Hat Formation over a portion of each section.

An issue implicit in the above is whether the granting of the application would hinder the detection of possible migration of gas between the intervener's and applicant's zones of interest, such migration caused by gas well operations.

The economic and conservation aspects of the application are not discussed in this report because of the Board's prior agreement in principle with the requested commingling and the applicant concedes that production would likely be economically viable, though less profitable, if the zones were segregated.

An issue beyond the scope of the application that has become apparent to the examiners is the need to re-designate the Medicine Hat pools in the Medicine Hat Field. As this issue is not a part of the application, it is omitted from the main body of this report but discussed in Appendix 1.

3 VIEWS OF THE APPLICANT

M-P was confident that the commingling of production from the Milk River and Lower Medicine Hat Formations would not affect the intervener's rights in the Medicine Hat Formation. As approximately 60 feet of shale and silt exist between the sand developments of the Medicine Hat and Lower Medicine Hat Formations, M-P concluded that "cross drainage" between the two formations would not occur. It believed that the fractures in the Lower Medicine Hat Formations would initiate and propagate preferentially into the sand and would not likely extend through the shale intervals.

Assuming, however, that vertical migration of gas could exist behind the casing (in a "micro-annulus") under unusual circumstances, M-P believed that it would be essentially impossible to monitor the minor leakage by analysing production rates or any other method. This difficulty was attributed to the large variations that exist from well to well in the producing characteristics of these zones. M-P cited several examples of closely spaced Milk River wells that exhibited widely different production rates despite similar reservoir properties. M-P acknowledged, however, that control wells with segregated production would provide an indication of the total production from the separate zones, and indicated that the initial flow rates at certain other wells could be determined for individual zones within three months after production begins, by flow tests from zones segregated by packers. (In local areas approved for commingling, the Board requires that production be taken in a segregated manner from four wells in each township).

M-P asserted that a reliable cement bond can be effected by the use of two scratchers at each end of the centralizers placed above and below each zone, and by the addition of fluid-loss additives to the cement. To satisfy the Board concerning the integrity of the cement bonds, M-P offered to run a reasonable number, perhaps six, cement bond logs. It indicated, however, the impracticality of running the logs after fracturing, because the logging procedure involves filling the well with water which could result in permanent impairment of the productive capacity of the well.

M-P believed that migration of gas from the Medicine Hat Formation would not be influenced by whether the production from the Milk River and Lower Medicine Hat Formations is commingled or segregated. In either case, the Medicine Hat Formation would be equally susceptible to reservoir leakage, if such were indeed possible.

4 VIEWS OF THE INTERVENER

As indicated by Figure 1, Pembina is the lessee of the rights to the Medicine Hat Formation in most of the area of application.

Pembina is concerned that gas at significant rates could flow behind casing from the Medicine Hat Formation to the Milk River or Lower Medicine Hat Formations. Its concern is based primarily on the possibility of the cement bond deteriorating after the Milk River or particularly the Lower Medicine Hat Formation is fractured.

Pembina suggested the running of a cement bond log after fracturing to detect deterioration but conceded that the procedure would be inconvenient and expensive.

Pembina maintained that an analysis of the production decline rates would be the most appropriate method of determining whether the Medicine Hat Formation is contributing to a well completed for Milk River or Lower Medicine Hat production. Therefore, its objection to the application was prompted by its belief that any migration from the Medicine Hat Formation would increase the total production from a well more conspicuously if the Milk River and Lower Medicine production were segregated rather than commingled.

Pembina indicated, nevertheless, that it would accept commingling of production from the Milk River and Lower Medicine Hat Formations if there were an adequate number of control wells along with a reasonable number of logs to check the quality of the cement bond. It did not elaborate on these requirements.

Referring to Section 22, Township 14, Range 5, W4, and Sections 5, 8, and 9, Township 14, Range 6, W4, where the rights to the Medicine Hat Formation are areally divided between the applicant and the intervener, Pembina explained that its rights cannot be pooled or unitized with the applicant's rights due to restrictions in its sales contract.

5 VIEWS OF THE EXAMINERS

Gas will not migrate from the Medicine Hat Formation to the Milk River or Lower Medicine Hat Formation behind the casing if a good quality cement bond can be maintained. A good quality cement bond can be obtained initially at wells in the area of application by following the procedures outlined in Appendix 1 to Interim Directive No. ID-OG 76-1. A cement bond log can be run before fracturing to assess the quality of the cement bond without causing a hazard to the well. If, however, the log is run after fracturing, the logging procedure could impair the producing capability of the well.

Notwithstanding the above, the examiners recognize that communication between formations could be effected either behind the casing or within the reservoirs as a result of fracture treatment. However, the examiners believe that these situations could occur regardless of whether production is segregated or commingled.

The examiners endorse the subsisting pattern of one control well for each quarter township to measure segregated production, but believe that the data from the relevant control wells will not aid in detecting any minor and unforeseen leakage of gas from the Medicine Hat Formation.

The examiners accept the applicant's view that detection of migration would not be materially enhanced by the maintenance of segregated status. Consideration of the relatively depleted condition of the Medicine Hat Formation in the area of application leads the examiners to believe that migration of gas could take place in either direction between the Medicine Hat and Lower Medicine Hat Formations if channels of communication exist either behind the casing or through fractures. In either case, however, it would be difficult to monitor such migration.

The examiners conclude that the application should be approved in the 31 sections (Area II of Figure 1) where the applicant holds the rights to the Milk River and the Lower Medicine Hat Formations and in the two sections (Area I of Figure 1) where the applicant holds the rights to the Milk River, Medicine Hat and Lower Medicine Hat Formations.

Concerning the four sections in which the lease rights are divided areally (Area I in Figure 1), the application to commingle production from all three formations is appropriate only for the south half of Section 22, Township 14, Range 5, W4, and the east half of Section 5, Township 14, Range 6, W4, because each half section constitutes a special drilling spacing unit in which the applicant holds the natural gas rights to the three formations.

In order that commingling of production from two or more formations within a drilling spacing unit may be approved, the applicant must own the rights to the formations in the entire unit. Consequently, it is not appropriate to commingle production from the three formations in the north half of Section 22, Township 14, Range 5, W4, and the west half of Section 5 and all of Sections 8 & 9, Township 14, Range 6, W4. However, the applicant does hold rights to the Milk River and the Lower Medicine Hat Formations in the above mentioned units and should be permitted to commingle production from these two formations.

In all cases where approval is granted, the applicable Board Order should reference the appropriate pools as discussed in this report.

6 RECOMMENDATIONS

The examiners recommend that:

(a) Pools be approved as pools from which production may be taken without segregation in the well bore as follows:

(i) Pools contained in the Milk River, Medicine Hat and Lower Medicine Hat Formation in the south half of Section 22, Township 14, Range 5, W4, east half of Section 5, Township 14, Range 6, W4, and in Sections 4 and 19, Township 14, Range 6, W4.

(ii) Pools contained in the Milk River and Lower Medicine Hat Formations in the entire remaining area of application.

(b) M-P be required to run logs to indicate the quality of the cement bonds, prior to fracturing, at about six strategically located wells in the area of application.

(c) Board Order No. MU 133 be amended to accommodate the decisions made with respect to this application.

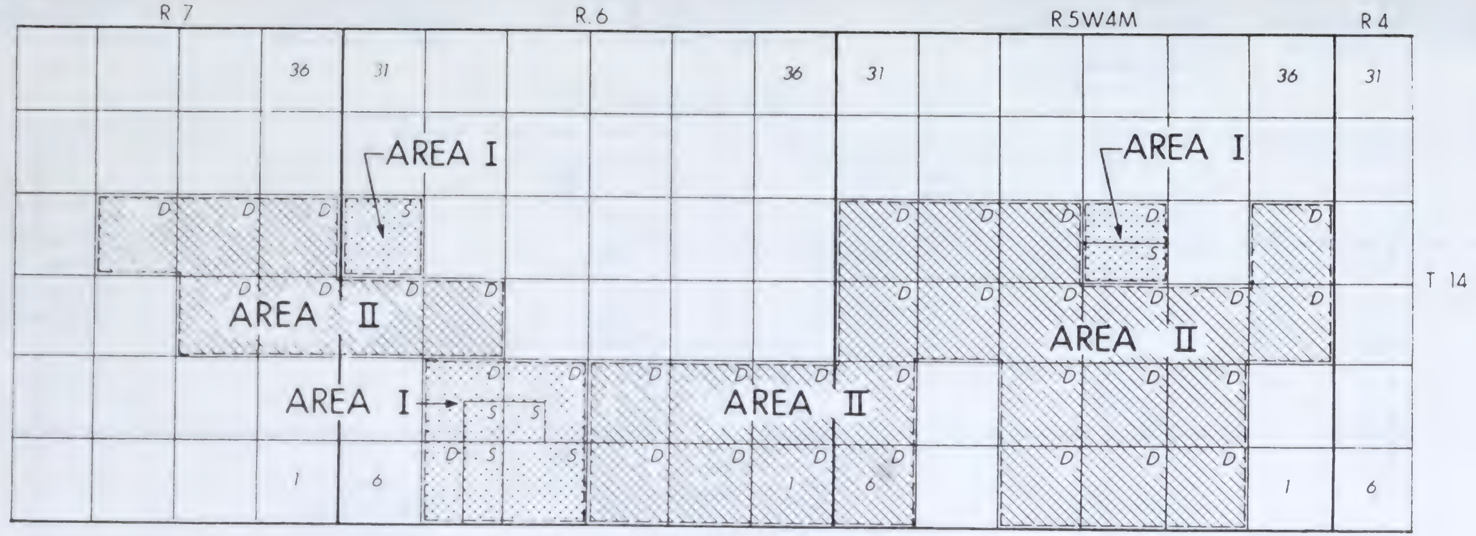
7 DECISION

The Board agrees with the recommendations of the examiners in this report and in Appendix 1, and it authorizes the appropriate amendments to Board Orders No. MU 133 and No. G 1964.

ENERGY RESOURCES CONSERVATION BOARD

D. R. Craig, P. Eng.
Vice Chairman

DATED 9 July 1976
Calgary, Alberta



AREAS AND FORMATIONS UNDER APPLICATION FOR COMMINGLING

▨ AREA I : MILK RIVER, MEDICINE HAT AND LOWER MEDICINE HAT

▨ AREA II: MILK RIVER AND LOWER MEDICINE HAT

LEASE HOLDERS

D - DUAL LEASE HOLDERS (ZONE SEGREGATED)
M-P: MILK RIVER AND LOWER MED. HAT
PEMBINA: MEDICINE HAT FORMATION

S - SINGLE LEASE HOLDER
M-P: MILK RIVER, MEDICINE HAT AND
LOWER MED. HAT FORMATIONS

FIGURE 1 AREA OF APPLICATION AND LEASE HOLDERS
Attachment to Examiners' Report on Application No. 8981

ENERGY RESOURCES CONSERVATION BOARD
CALGARY, ALBERTA MAY, 1976

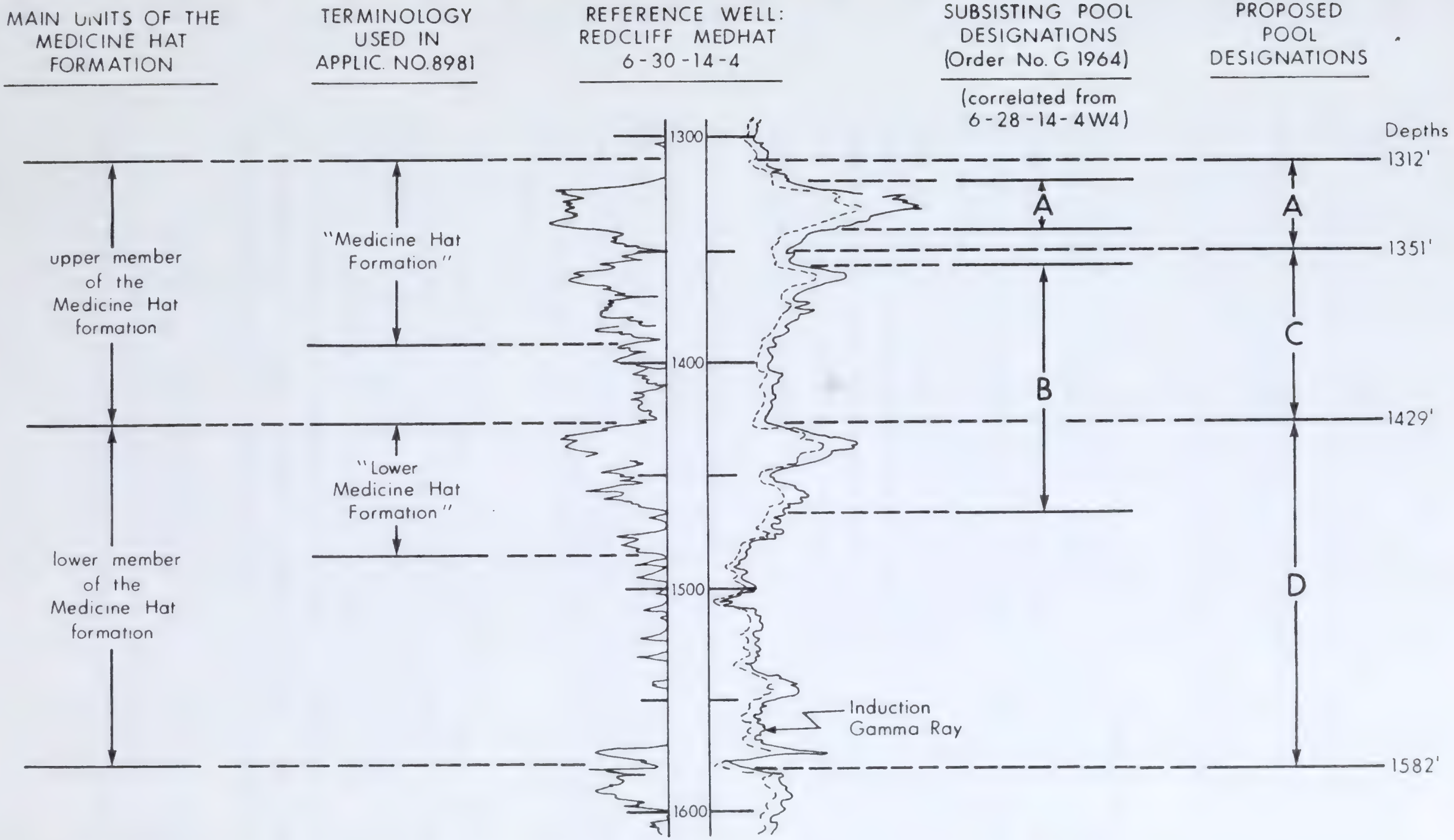

MAIN UNITS OF THE MEDICINE HAT FORMATION
TERMINOLOGY USED IN APPLIC. NO.8981
REFERENCE WELL: REDCLIFF MEDHAT 6-30-14-4
SUBSISTING POOL DESIGNATIONS (Order No. G 1964)
(correlated from 6-28-14-4W4)
PROPOSED POOL DESIGNATIONS
Depths
1312'
1351'
1429'
1582'
upper member of the Medicine Hat formation
lower member of the Medicine Hat formation
"Medicine Hat Formation"
"Lower Medicine Hat Formation"
1300
1400
1500
1600
Induction
Gamma Ray
A
B
A
C
D

FIGURE 2 ZONE TERMINOLOGY AND POOL DESIGNATIONS IN THE MEDICINE HAT FORMATION

Attachment to Examiners' Report on Application No.8981

ENERGY RESOURCES CONSERVATION BOARD
CALGARY, ALBERTA MAY, 1976

APPENDIX 1 RE-DESIGNATION OF THE MEDICINE HAT POOLS IN THE MEDICINE HAT FIELD

Figure 2 of the Examiners' Report on Application 8981 indicates that the subsisting Medicine Hat Medicine Hat A and B Pools (hereinafter referred to as the A and B Pools) are separated by only 15 feet of shale and silt at the well used in the illustration. This separation becomes less distinct at other localities in the field. The examiners believe that these closely positioned sands should have constituted only one pool when the A and B Pools were originally designated. However, as the gas-bearing sands have been assigned to different pools, it is administratively convenient to continue their separate pool identity, as proposed in the right hand illustration of Figure 2.

As shown by this illustration, the examiners propose that the subsisting B Pool be re-designated as the Medicine Hat Medicine Hat C Pool and that the interval for the pool be reduced to totally exclude the Lower Medicine Hat Formation. The change in pool name is warranted to reflect this revision to the stratigraphic interval being proposed for the pool.

Finally, the examiners recommend that all sands and silts within and immediately below the Lower Medicine Hat Formation be separately designated as the Medicine Hat Medicine Hat D Pool. The base of this pool was chosen to correspond to a widespread marker known as the "Cardium equivalent" and considered by the examiners to represent the base of the actual Medicine Hat Formation. The well, REDCLIFF MEDHAT 6-30-14-4, was adopted as the reference well because it penetrated the "Cardium equivalent" marker.

The reasons for including major shale intervals within the proposed pools is to avoid future problems of pool designation and commingling approval for small gas-bearing accumulations found in these intervals.

Corresponding pool designations may be extended beyond the Medicine Hat Field if such is appropriate.

On the Induction Gamma Ray log for the well, REDCLIFF MEDHAT 6-30-14-4, the proposed pools occupy the following intervals:

PROPOSED POOL	INTERVAL (Feet)
Medicine Hat Medicine Hat A	1 312 to 1 351
Medicine Hat Medicine Hat C	1 351 to 1 429
Medicine Hat Medicine Hat D	1 429 to 1 582

LEGAL ERCA-4 OMAR-4 OAR-4 HEA-4
OGAR*-4 GRAR-4 [illegible]AR-4 PLAR-4 CAR-4
IL-3 ILC-3 ILHE-3 ILOG-3 ILPL-3
IDC-3 II-3 IDHE-3 IDOG-3 IDPL-3
CA-1 DEC-2 Gen-2 O&A-1

ENERGY RESOURCES CONSERVATION BOARD
Calgary Alberta Canada

COMMON CARRIER
RICINUS D-3 A POOL

Decision 76-10
Application No. 9406

1 INTRODUCTION

1.1 THE APPLICATION AND HEARING

Mobil Oil Canada, Ltd. filed an application on 9 June 1976 for rescission of Order No. Misc 7511 which declared the proprietor of the secondary gas pipeline from the Ricinus D-3 A Pool, hereinafter referred to as the pool, to the Aquitaine Ram River Plant to be a common carrier.

The application was heard by the Board in Calgary, Alberta on 4 August 1976 with D. R. Craig, P. Eng., V. Millard, and N. A. Macleod, Q. C. sitting.

1.2 APPEARANCES

The following appeared at the hearing:

	Presented by	Witnesses
Mobil Oil Canada, Ltd. (Mobil)*	E. M. Bredin, Q. C.	R. R. Schoemaker
Pacific Petroleum Ltd. (Pacific)*	J. L. Snith	W. W. McLaughlin
Chevron Standard Limited (Chevron)*	R. R. Mahaffey	
Board Staff	R. J. Willard R. L. Archibald, P. Eng.	

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* Abbreviation used in this report.

2 BACKGROUND

In May 1975 Mobil submitted Application No. 8547, pursuant to sections 35 and 49 of The Oil and Gas Conservation Act for a rateable take order for gas produced from the pool and for a common carrier declaration for the 8-inch secondary pipeline from the pool to the Ram River Plant and the 2-inch fuel pipeline from the Ricinus Plant to the pool.

Following the hearing on 17 July 1975, the Board issued Order No. Misc 7511 declaring Pacific Petroleums Ltd., proprietor of the 8-inch secondary gas pipeline from the Ricinus D-3 A pool to the Aquitaine Ram River Plant, to be a common carrier of gas produced from the pool. The Board deferred its decision on the rateable take of gas and the common carrier declaration for the 2-inch fuel line to allow further time for unitization negotiations. The Ricinus D-3 A Pool was unitized effective 1 June 1976.

3 VIEWS OF THE APPLICANT

Mobil stated that because of the formation of the Ricinus D-3 A Gas Unit No. 1, the common carrier status of the proprietor of the 8-inch gas pipeline from the pool to the Ram River Plant was not needed. The unit facilities comprised the above mentioned 8-inch gathering line and the 2-inch fuel line from the Ricinus Plant. Upon examination, Mobil stated that it had abandoned the parts of its earlier application that concerned the rateable take of gas and the common carrier status for the 2-inch fuel line.

4 VIEWS OF PACIFIC

Pacific wished to go on record as supporting Mobil's application for rescission of Board Order No. Misc 7511.

5 VIEWS OF THE BOARD

The Board agrees that, following the unitization of the pool, the common carrier declaration for the 8-inch secondary gas pipeline is not needed. Further, the Board notes and accedes to the withdrawal of the portions of Application No. 8547 that apply for rateable take of gas and a common carrier order for the 2-inch fuel line.

6 DECISION

The Board, with the approval of the Lieutenant Governor in Council, is prepared to rescind Order No. Misc 7511.

DATED at Calgary, Alberta on September 13, 1976.

ENERGY RESOURCES CONSERVATION BOARD

DR Craig

D. R. Craig
Vice Chairman

ENERGY RESOURCES CONSERVATION BOARD
Calgary Alberta

ALBERTA OIL SANDS PIPELINE LTD.
OIL LINE
FORT MCMURRAY TO EDMONTON

Decision 76-11
Application 9138

1. INTRODUCTION

1.1 The Application and Hearing

Alberta Oil Sands Pipeline Ltd. filed an application with the Board pursuant to Part 4 of The Pipeline Act, 1975, for a permit to construct an oil line for the transmission of synthetic crude oil from the Mildred Lake Extraction Plant of Syncrude Canada Ltd. to the Interprovincial Pipe Line Limited terminal in Edmonton, as indicated on Map 1. The proposed line would comprise some 270 miles of 22-inch pipe and 7 miles of 20-inch pipe, with four pump stations along the route.

A hearing of the application before the Energy Resources Conservation Board was held, in Edmonton, on May 25, 1976 with D.R. Craig, P. Eng., N. Berkowitz, P. Eng. and G.J. DeSorcy, P. Eng. sitting. The hearing was originally to be held on May 26, 1976, but was rescheduled by the Board, and a notice to this effect was forwarded to all landowners on the proposed route, as well as being advertised in the same manner as the original notice of hearing.

The following appeared at the hearing.

	WITNESSES
Alberta Oil Sands Pipeline Ltd. (Alberta Oil Sands Pipeline) represented by G. F. Dixon	Canuck Engineering Ltd. G. W. Walker, P. Eng. W. Bruce, P. Eng. J. A. Stewart, P. Eng.

	Alberta Energy Company Limited
	N. J. Lashuk, P. Eng. J. E. Ellefson, P. Eng.
	Canadian Engineering Surveys Co. Ltd.
	L. E. Raessler
	Renewable Resources Consulting Services Ltd.
	K. McCourt
	Spence Taylor & Associates Limited
	R. S. Taylor, P. Geol.
Albersun Pipeline Ltd. (Albersun) represented by R. C. Egglestone, P. Eng.	
CU Engineering Limited (CU) represented by D. R. Bailey	T. O. Neumann, P. Eng.
Energy Resources Conservation Board Staff (Board Staff) E. G. Fox, P. Eng. C. P. Outtrim, P. Eng. J. S. Owen represented by A. L. McLarty	

NOTE: Abbreviations shown in parenthesis are used in this report. In addition, the Board received several submissions both prior to and after the hearing from parties who were not represented at the hearing. The following is a listing of these interveners, and the positions which they adopted.

Walter G. Smith, in a letter dated April 23, 1976, objected to the pipeline route from Boyle to Redwater.

Petrofina Canada Ltd., in a letter of intervention dated May 11, 1976, stated its intent to cross-examine and advance possible argument.

The Archaeological Society of Alberta, in a letter dated May 11, 1976, recommended that the Board require an archaeological assessment of the proposed pipeline route.

Ed Lasner, in a notice of objection dated May 18, 1976, objected to the routing of the pipeline through his property, the south half of section 20, township 57, range 21, west of the 4th meridian.

Ann Begoray, in a letter of intervention dated May 25, 1976, opposed the routing of the pipeline through her property, the south-east quarter of section 19, township 57, range 21, west of the 4th meridian, and stated that the proposed compensation was inadequate.

Syncrude Canada Ltd., in a letter dated July 14, 1976, requested that the Board consider revising the proposed route of the pipeline in the vicinity of Skaro, in order to avoid two river crossings.

2. THE ATHABASCA TAR SANDS CORRIDOR

In 1973, the Minister of Alberta Environment authorized the Athabasca Tar Sands Corridor Study. This study was to investigate and make recommendations regarding the feasibility and desirability of placing pipelines carrying synthetic crude oil and other products in a single corridor with other existing or future utilities and transportation systems, and to select a corridor route and the location of a terminal. The conclusions and recommendations of this study were announced in October 1974, at which time the Alberta government stated its objective to develop such a corridor.

3. DEFINITION OF ISSUES

The Board considers the issues of this application to be:

a) the need for a pipeline, and

b) the suitability of the design and of the proposed pipeline route.

4. VIEWS OF THE APPLICANT

Alberta Oil Sands Pipeline stated that, given the constraints imposed by the Athabasca Tar Sands Corridor, the proposed pipeline is the most economical means of transporting synthetic crude oil from the Syncrude plant to Edmonton.

The volumes of synthetic crude oil to be transported by the proposed pipeline are expected, by the applicant, to increase as follows:

YEAR	MAINLINE MAXIMUM DAILY THROUGHPUTS (BBL)
1978	69000
1979	137000
1980	137000
1981	137000
1982	137000
1983	150000
1984	163500

The applicant said it had considered several alternative pipeline designs, including the utilization of existing pipelines, but these were all rejected as impractical. The proposed pipeline is considered suitable for serving the Syncrude plant, with the capability for carrying additional oil by adding pump stations in the future, if this is found necessary, for a maximum throughput in excess of 240000 bbl per day.

The applicant stated that the pipeline route, from a point about 30 miles south of the Athabasca River to Skaro, lies in the transportation corridor delineated by the Athabasca Tar Sands Corridor Study Group. The minor departures from the northern portion of the suggested corridor would provide a more direct route to the selected terminal site, west of the Syncrude plant; allow crossing of the Athabasca River at a location with as stable banks as could be found; avoid a pipeline crossing of the Athabasca River within the Fort McMurray townsite; and reduce intrusion of the pipeline right of way into economically mineable oil sands areas.

The route of the gathering pipeline, from the Syncrude plant to the Alberta Oil Sands Pipeline terminal (indicated on Map 2), was specified by Syncrude Canada Ltd. The applicant noted that the pipeline would not interfere with the initial 25 year mining program, or with the mining thereafter, but did not present an evaluation of the amount of recoverable oil sands reserves which might be rendered unmineable by this portion of the pipeline.

An important consideration in the selection of the Alberta Oil Sands Pipeline terminal was the need to place it beyond an area of likely mining, although field investigations to determine the amount of in-place bitumen reserves beneath the site had not been carried out.

The route of the southern end of the pipeline was determined by its acceptability to Alberta Environment. The applicant said that, had the Government not imposed the corridor constraints, Alberta Oil Sands Pipeline would have preferred to route the pipeline so as to avoid the two crossings of the North Saskatchewan River near Skaro.

5. VIEWS OF THE INTERVENERS

5.1 Albersun Pipeline Ltd.

Albersun did not provide direct testimony relating to the application, and limited its participation to cross examination of the applicant.

5.2 CU Engineering Limited

CU supported the application of Alberta Oil Sands Pipeline and stated its intent to apply, in due course, for a permit to construct a gas pipeline adjacent to the proposed pipeline. This gas pipeline would serve the Syncrude plant.

6. VIEWS OF THE BOARD

The Board agrees with the applicant that the proposed pipeline is required to transport synthetic crude oil produced at the Syncrude plant, to Edmonton. The Board is also satisfied that the general engineering design of the proposed pipeline is adequate for the purpose and in conformance with the requirements of The Pipeline Act, 1975. The size of pipeline proposed by the applicant is, in the Board's view, reasonable and acceptable. It is noted that the proposed line would be capable of moving quantities of oil in excess of those presently proposed to be moved by the applicant, by the addition of further pumping stations.

The Board considers the most important questions concerning the proposed pipeline to be those related to the proposed route. For the most part, the applicant intends to follow the route recommended by the Athabasca Tar Sands Corridor Study Group, and the Board notes that the development of this corridor has been endorsed, in principle, by the Alberta government as a matter of policy.

A significant feature of the proposed route, and of the corridor, is the provision of access to the future Skaro terminal site proposed by the Study Group. The Board believes that the value of a future major terminal at this location may be diminished by delayed construction of future oil sands extraction plants. The declining rate of discovery of conventional oil reserves could, in the Board's view, create surplus capacity in existing pipeline systems radiating from Edmonton, which could then be used to transport output from future extraction plants. The concept of a pipeline terminal in the vicinity of Skaro does, however, have merit in that pipelines could be extended from this location to serve projected petrochemical and industrial development south of the North Saskatchewan River. Accordingly, the Board concludes that the proposed routing through Skaro is not a major disadvantage. Otherwise, the Board is satisfied that no alternate route would offer significant advantages over the corridor routing, and insofar as the proposed route follows the adopted corridor, the Board considers it to be satisfactory.

The Board notes that the intended route will vary from the suggested corridor in the northern portion of the proposed pipeline. With respect to that portion, the Board believes that the more direct route to the selected terminal site, the lesser intrusion of the pipeline right of way into economically mineable oil sands areas, the avoidance of the Fort McMurray townsite and the environmental concerns respecting the crossing of the Athabasca River are more than adequate justification for the route selected. The Board, therefore, is generally satisfied that this deviation is necessary.

The Board is, however, concerned about the proposed location of the gathering line and terminal site. Although the Board appreciates that the route of the gathering line was specified by Syncrude Canada Ltd., it believes the location of the line may overlie significant recoverable reserves of crude bitumen which may necessitate the relocation of the gathering line within twenty years. The Board is prepared to accept the proposed route, but will require the applicant to relocate the line if this comes to be in the public interest. The Board is similarily concerned with the proposed location of the terminal site and will, prior to approving the site, require that a test hole be drilled for purposes of evaluating the oil sands reserves in the area.

With respect to the applicant's proposal for the route from Skaro via Redwater into Edmonton, the Board notes that the applicant intends to utilize an existing pipeline right of way from Redwater into Edmonton. This involves two additional crossings of the North Saskatchewan River to adhere to the Skaro terminal concept. Although the Board recognizes that these extra crossings are to some extent undesirable from an environmental standpoint, it notes that this section of the route and the crossings have been approved by Alberta Environment, and is prepared to accept it. The Board finds that the proposed routing from Skaro to Edmonton is advantageous in that it provides access to Edmonton with less potential surface disturbance than an alternative new pipeline right of way into the metropolitan area.

The Board, therefore, accepts the routing of the proposed pipeline as being that which accommodates, where possible, the long term government strategy of provincial resource development, yet retains a recognition of current practical routing limitations.

7. DECISION

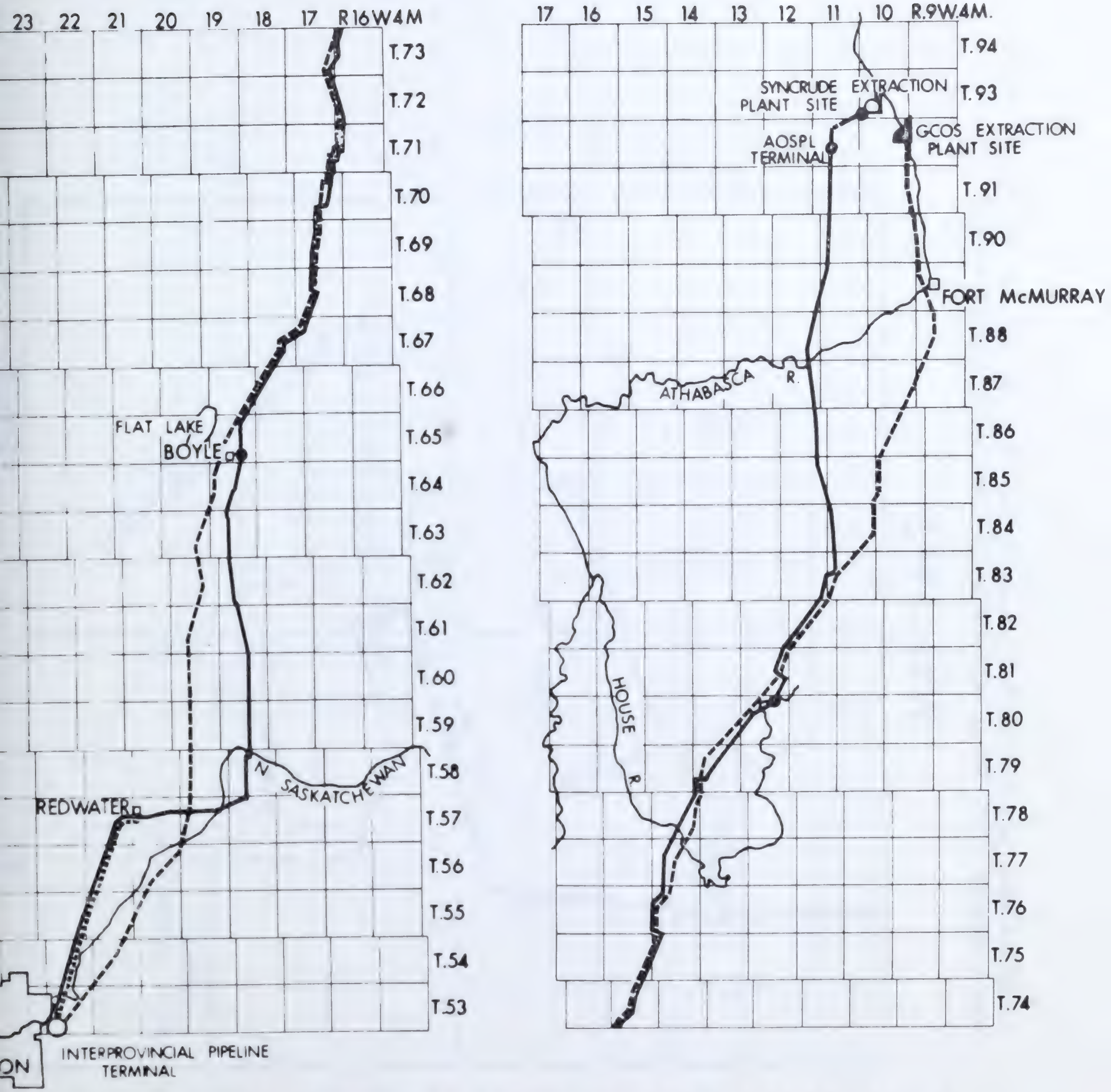
The Board grants the application of Alberta Oil Sands Pipeline Ltd. and is issuing a permit for the construction of the proposed pipeline. Approval of the proposed terminal, located in section 16, township 92, range 11, west of the 4th meridian is contingent upon the receipt by the Board of the applicant's evaluation of crude bitumen reserves beneath this site. Following a review of the evaluation, the Board may approve the construction of the terminal at the proposed or another location.

ENERGY RESOURCES CONSERVATION BOARD

D R Craig

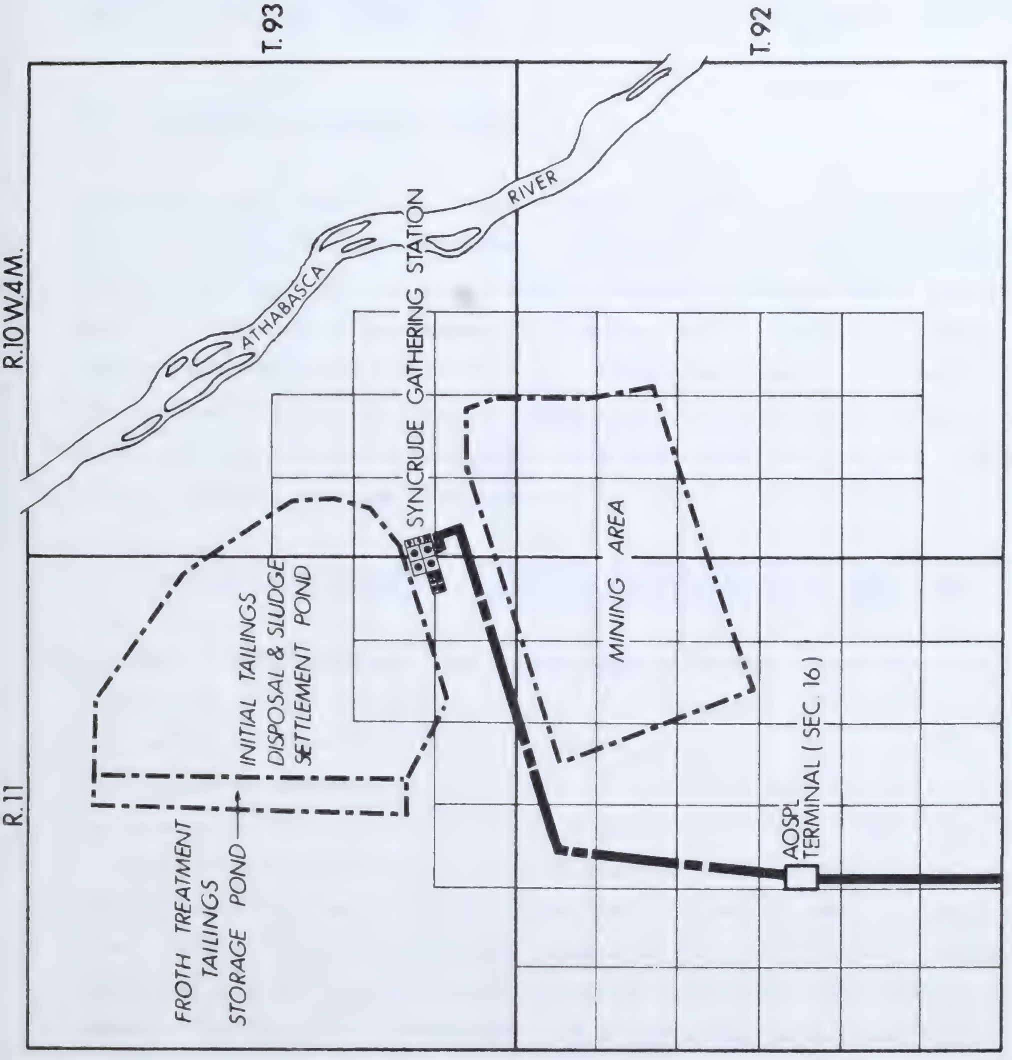
D. R. Craig, Vice Chairman

DATED October 18, 1976
Calgary Alberta



EDMONTON - FORT McMURRAY AREA (MAP No. 1)

———	PROPOSED 22 INCH ALBERTA OIL SANDS PIPELINE (APPLICATION No 9138)
— — —	PROPOSED 20 INCH GATHERING LINE (APPLICATION No. 9138)
- - - - - - -	EXISTING GCOS 16 INCH PIPELINE
··············	EXISTING IMPERIAL PIPELINE CO. PIPELINE
●	PROPOSED PUMP STATIONS



MAP No. 2

━ PROPOSED 22 INCH ALBERTA OIL SANDS PIPELINE (APP. No. 9138)
━ ━ PROPOSED 20 INCH GATHERING LINE (APP. No. 9138)

ENERGY RESOURCES CONSERVATION BOARD
Calgary Alberta

THE ALBERTA GAS TRUNK LINE COMPANY LIMITED
EDSON AND FOOTHILLS EXTENSIONS

Interim Decision 76-12
Applications 9162, 9219

1. THE APPLICATION AND HEARING

The Alberta Gas Trunk Line Company Limited applied to the Board for permits to construct two pipelines, referred to as the Edson Extension (Application Number 9162) and Foothills Extension (Application Number 9219), consisting of approximately 29 miles and 87.7 miles of 36-inch diameter steel pipe respectively, for the transmission of natural gas. The applications were heard at a public hearing in Edmonton on June 17, 18 and in Calgary on June 21, 1976, with D.R. Craig, P. Eng., V. Millard and G.J. DeSorcy, P. Eng. sitting.

2. SUBSEQUENT SUBMISSION OF ALBERTA GAS TRUNK LINE (TRUNK LINE)

Subsequent to the hearing, Trunk Line made an urgent request of the Board to render an early decision with respect to the applications to enable construction of the crossing of the Peace, Smoky and Simonette rivers and to approve clearing of the rights of way through those river valleys. The request by Trunk Line was a direct result of a letter dated September 28, 1976, to Trunk Line by Alberta Recreation, Parks and Wildlife, wherein they advised of a request to the Department of Environment, to amend permits issued by it pursuant to The Water Resources Act, to prohibit pipeline construction in the valleys and beds of the Peace and Smoky rivers between January 1 and April 1. Trunk Line, in consequence, indicated to the Board that such a restriction on construction would prevent the timely construction of the required facilities, unless early approval to construct the pipeline through the major river valleys were granted by the Board.

3. BOARD VIEWS

The Board has completed its appraisal of the applications and its studies of the issues related thereto; but finds itself unable to complete its full report on its findings and reasons for decision, within the time constraints respecting the major river crossings. Consequently the Board has decided to issue this interim decision report and to issue a comprehensive and final report in due course.

In its consideration of the applications the Board found:

(a) That early expansion of Trunk Line's facilities north of Edson was required to alleviate gas transportation congestion.

(b) The proposed routes were satisfactory.

(c) The Board's independent evaluation of reserves in the vicinity of the applied for facilities and the associated deliverability schedule differs from that submitted by Trunk Line but not to such an extent as to affect the economic justification of the 36-inch line size.

(d) That the Public Utilities Board has been directed by Order-in-Council to review principles and methods of governing gas transportation costs within the Province providing an opportunity for consideration of this matter within the confines of existing legislation.

4. DECISION

The Board grants the applications for permits to construct the 36-inch diameter Foothills and Edson pipeline extensions. The pipeline permits are being issued concurrently and are restricted by the conditions imposed by the Departments of The Environment and Energy and Natural Resources.

ENERGY RESOURCES CONSERVATION BOARD

DR Craig

D. R. Craig
Vice Chairman

DATED October 8, 1976
Calgary Alberta

ENERGY RESOURCES CONSERVATION BOARD
Calgary Alberta Canada

TRANSMISSION LINE OF 240 kV AND JASPER SUBSTATION - EDMONTON POWER

Decision Report 76-13
Application 9188

SUMMARY

The Application

Edmonton Power Ltd. applied for a permit to construct and a licence to operate a 240/72-kV substation and a 240-kV double-circuit transmission line in western Edmonton; and for an order to connect the line to an adjacent Calgary Power transmission line for reasons of efficiency.

The Issues

The need for a 240-kV substation and 240-kV double-circuit transmission line.

The location of the proposed facilities.

The Board's Conclusions

There is a clear need for the facilities.

The location of the proposed substation, centrally sited in the western Edmonton load area and in an industrial zone, is appropriate.

The proposed route of the transmission line would create minimal aesthetic and land use disturbance.

The routing of the transmission line through the grounds of the Famous Players Theatre could, unless certain restrictions are adhered to, adversely affect the operation of the theatre.

The Board's Decision

The Board is prepared to grant the application subject to the following conditions:

That Edmonton Power satisfactorily modify the design of the line to prevent conductors overhanging the Famous Players Theatre's parking stalls.

That the approvals of the Ministers of the Environment and of Energy and Natural Resources regarding matters affecting the environment be obtained.

1 THE APPLICATION AND HEARING

Edmonton Power made the application pursuant to sections 9, 11, and 14 of The Hydro and Electric Energy Act for permits, licences, and approvals to construct and operate a 240/72-kV substation, a 240-kV double-circuit transmission line and an interconnection with an adjacent Calgary Power Ltd. transmission line.

A public hearing to consider the application was held by the Energy Resources Conservation Board in Edmonton on 29 June 1976, with V. Millard, N. Berkowitz, P.Eng., and G. J. DeSorcy, P.Eng., sitting.

THOSE WHO APPEARED AT THE HEARING

Principals and Representatives (Abbreviation Used in Report)	Witnesses
The City of Edmonton (Edmonton Power) H. F. Wilson	R. McClary, P.Eng. A. Sadesky, P.Eng. T. Loat J. Rapp
Calgary Power Ltd. (Calgary Power) H. M. Kay	W. Nieboer, P.Eng.
Famous Players Limited (Famous Players) R. A. Dixon, Q.C.	R. F. Reinhardt
Triple Five Corporation and Northern Trading Co. Ltd. R. E. Hyde, Q.C. Miss L. M. A. Lees	R. E. Hyde, Q.C.
A Group of Eight Parties (The Price Group) F. C. R. Price	Alice Romaniuk
Triple Five Corporation and a Group of Thirteen Parties (The Turner Group) P. C. Turner	P. C. Turner
Energy Resources Conservation Board Staff A. L. McLarty D. G. Beamer	

2 BACKGROUND

2.1 Existing Transmission Facilities

The present configuration of the transmission system in Edmonton is shown in Figure 1. Edmonton Power's energy requirements are met by its Clover Bar and Rossdale power plants, which are interconnected with Calgary Power's substation CP 38S by a 240-kV line. In addition, Edmonton Power's Lambton substation is interconnected with Calgary Power's transmission line CP 904L. Western Edmonton is now supplied by 72-kV lines from the Rossdale power plant via the Meadowlark and Woodcroft substations.

2.2 The Issues

The Board considers the issues of the application to be:

(a) The need for a 240-kV substation and 240-kV double-circuit transmission line, and

(b) The location of the proposed facilities.

3 THE NEED FOR THE PROPOSED FACILITIES

3.1 Views of the Applicant

Edmonton Power stated that since 1960 the annual rate of growth in the power load in western Edmonton had varied between 9 and 11 per cent and exceeded the average of 8.6 per cent for Edmonton as a whole and that this trend was expected to continue for the next five to ten years. The applicant's projection showed that the future load to be supplied by the proposed Jasper substation would grow from 149 MVA[1] in 1976 to approximately 180 MVA by 1979. The applicant further stated that the load capacities of the existing Meadowlark and Woodcroft substations would be inadequate to meet the projected 1976/1977 winter peak demand.

The applicant stated that system security and reliability would be improved, and fault levels throughout its entire 72-kV system reduced, if the loads in western Edmonton were transferred from the Meadowlark and Woodcroft substations to the proposed Jasper substation.

Edmonton Power also indicated that the 240-kV interconnection with Calgary Power's transmission line CP 904L would allow more efficient transmission from the Clover Bar power plant and that the proposed transmission line would also form an integral part of its 240-kV ring system.

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[1] 1MVA = 1 000 000 volt-amperes, a measure of electric load.

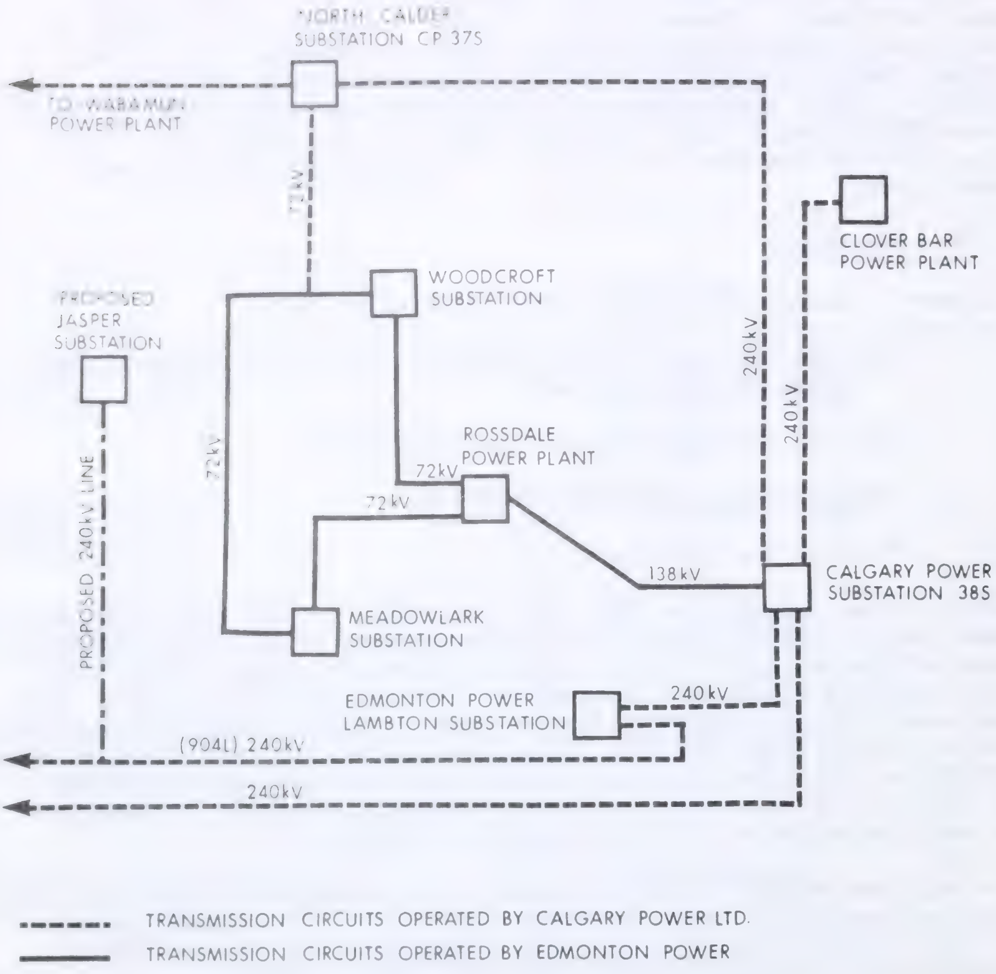


FIGURE 1 TRANSMISSION LINES IN THE EDMONTON AREA

3.2 Views of the Interveners

The interveners did not question the need for the transmission line. Calgary Power agreed that a need existed and would be met by the proposed facilities.

3.3 Views of the Board

The Board accepts Edmonton Power's forecast of load and concurs that existing facilities would be inadequate to meet the 1976/1977 winter peak demands reliably in western Edmonton. It therefore considers the proposed facilities and their interconnection with Calgary Power's system to be necessary.

4 LOCATION OF THE PROPOSED FACILITIES

The route of the proposed transmission line EP 904L, shown in Figure 2, commences at A and runs for six miles north to D on a 100-foot right of way. The 1½ miles of line from D to the proposed substation at E is on a 90-foot right of way. Virtually all the right of way from A to C would lie within the Edmonton Restricted Development Area.

Ministerial consent for construction of the transmission line in the Restricted Development Area has been granted by Alberta Environment, to Edmonton Power, pursuant to the provisions of the Edmonton Restricted Development Area regulations, but Edmonton Power has been requested to handcut the right of way wherever it crosses a ravine.

4.1 Views of the Applicant

Edmonton Power stated that it had originally intended to locate the north-south portion of the line within the city boundaries. However, with the establishment of a Restricted Development Area on the west side of the city limits, the location of the route was revised to accommodate it within the Restricted Development Area. To avoid conflict with an existing development, and to take advantage of some publicly owned land, a portion of the line (point C to D in Figure 2) was located outside the Restricted Development Area.

Three alternative routes were considered but were rejected by Edmonton Power. Two of these would lie inside the Restricted Development Area. One, in the western portion, would cause severance to property; and the other would run along the centre-line of the Restricted Development Area, where a future proposed ring road may be located. The third alternative, about one mile west of the Restricted Development Area, was rejected by the applicant because it was outside what the applicant considered to be the intended utility corridor and also would be more costly.

The applicant indicated that the proposed route presented only two obstacles, the Wedgewood Ravine and the Parkland Drive-In Theatre. However, in the applicant's opinion crossing the ravine could be achieved with little disturbance to surrounding vegetation, and spanning the theatre's entrance and ticket office area should not in any way adversely affect the theatre's operation.

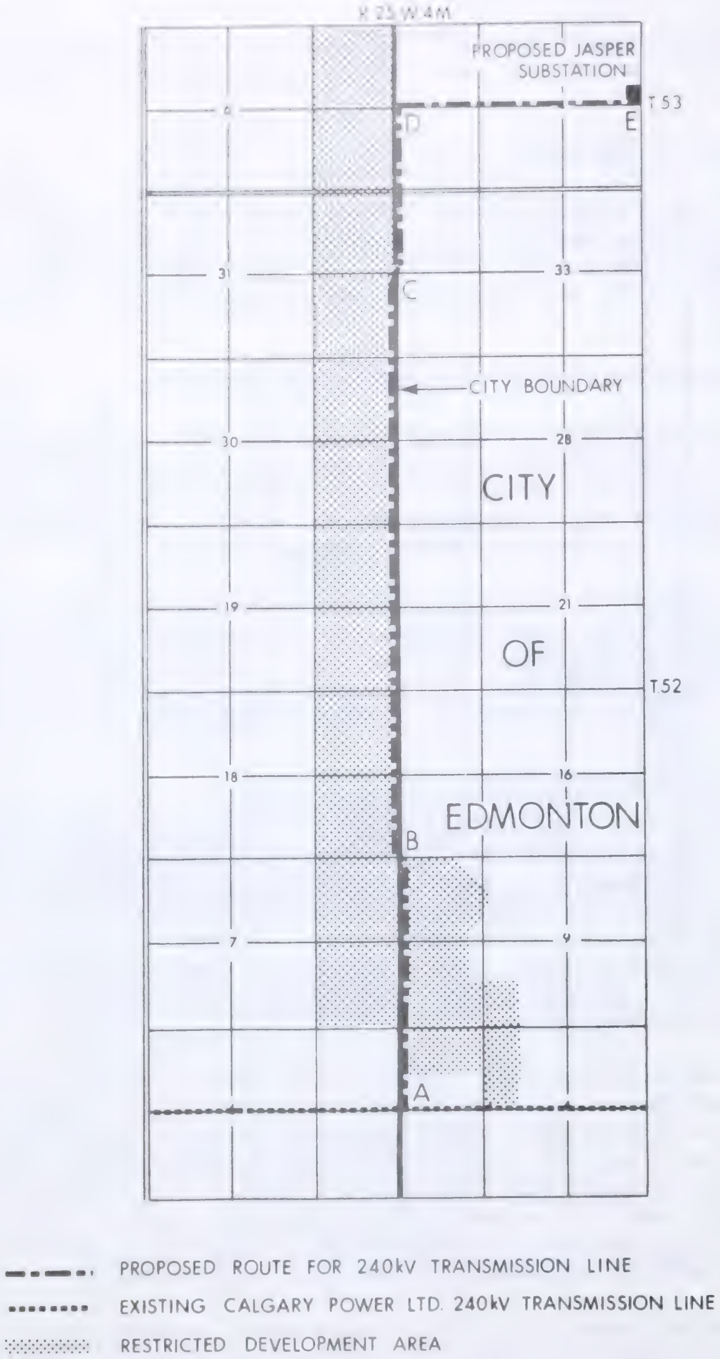

R.25 W.4M.
PROPOSED JASPER SUBSTATION
T.53
D
E
6
31
33
C
CITY BOUNDARY
30
28
CITY
19
21
OF
T.52
18
16
EDMONTON
B
7
9
A
PROPOSED ROUTE FOR 240kV TRANSMISSION LINE
EXISTING CALGARY POWER LTD. 240kV TRANSMISSION LINE
RESTRICTED DEVELOPMENT AREA

FIGURE 2 PROPOSED ROUTE OF THE EDMONTON POWER 240kV TRANSMISSION LINE EP 904 L

Estimated land costs for each of the rejected routes were estimated by the applicant to be approximately twice those of the proposed route. Edmonton Power stated that the estimated cost of the transmission line, excluding land costs, was roughly the same for each alternative route other than the route one mile west of the Restricted Development Area. The latter would be one mile longer and cost some $90 000 more.

Questioned by interveners, Edmonton Power stated that underground installation would cost approximately $2.2 million per mile as against some $120 000 for overhead construction.

In response to a question by the Board, the applicant observed that steel-pole structures for the entire line would cost an estimated $3.4 million compared with $2 million for the proposed combination of lattice towers and steel poles.

The applicant also pointed out that the site for the proposed Jasper substation was near the load centre and that this minimized the length of the distribution circuits. The siting of the substation would also conform to Edmonton Power's policy of locating such facilities uniformly throughout its distribution area.

4.2 Views of the Interveners

The Turner Group

Mr. Turner represented a group of thirteen owners of land in the north half of Section 17, Township 52, Range 25, west of the 4th Meridian and the southwest quarter of Section 19, Township 52, Range 25, west of the 4th Meridian. These owners opposed the proposed transmission line, because it would be on or adjoining what they considered to be the last remaining land in western Edmonton available for development. The City of Edmonton had applied to the Local Authorities Board for an order allowing annexation of this land. The group claimed that, if annexation took place, approval of Edmonton Power's proposal would adversely affect the new residential development.

The Turner Group recommended a new route for the transmission line 1½ miles west of the route proposed, noting that land in the Restricted Development Area would cost some $20 000 per acre for a 100-foot right of way compared with $4 000 per acre for land near the Stoney Plain Indian Reserve.

Famous Players

Famous Players Limited objected to the proposed route of the transmission line because it would traverse the area in which its Parkland Drive-In was located; the line would devalue the drive-in property; have a high environmental impact; and adversely affect the enjoyment and business operation of the drive-in. The quality of a sound system intended for the theatre might be impaired by interference from the line; and the conductors, which would be situated above the entrance, box office, and some parking stalls, might create a safety hazard.

Triple Five Group

The Triple Five Corporation and the Northern Trading Co. Ltd. opposed having the transmission line traverse the property in the northwest quarter of Section 17, Township 52, Range 25, west of the 4th Meridian and the west half of Section 20, Township 52, Range 25, west of the 4th Meridian because it would hinder residential development and reduce the value of the land. It was also stated that the location of the proposed outer ring parkway was still uncertain and, if any development were allowed west of the Restricted Development Area, the provincial government would probably place the ring road further west. It was contended that an alternative route for the transmission line, one mile west of the proposed route, would be entirely on agricultural land, interfere far less with development by the Triple Five Group, and cost less. It was also stated that Triple Five owned some land on which such an alternative right of way could be located, and would be willing to negotiate acquistion of a right of way with Edmonton Power.

The Price Group

Mr. Price represented a group of eight persons owning land in the northwest quarter of Section 29, Township 52, Range 25, west of the 4th Meridian and the southwest quarter of Section 32, Township 52, Range 25, west of the 4th Meridian. He stated that his clients objected to the proposed transmission line because the line would destroy, pollute, or deteriorate the area through which it passed, and that the applicant had presented insufficient information with respect to the environmental impact of the line. He said that Edmonton Power had considered no other method of transmission or seriously investigated alternative routes. Mr. Price also stated that the purpose of a Restricted Development Area, as described in the preamble of the regulations respecting the Restricted Development Area was to preserve the environment, not to provide a utility corridor.

4.3 Views of the Board

Regarding the proposed Jasper substation, the Board is satisfied that the proposed location, in an industrial zone and central to the load area, is appropriate.

Regarding the transmission line, the Board has assessed the economic, environmental, and technical aspects of the proposed and alternative routes having regard for the nature and extent of the objections.

Economic

The Board generally accepts the construction costs presented by Edmonton Power for the proposed and alternative routes. The additional length of the alternative routes located west of the Restricted Development Area would result in incremental construction costs ranging from $90 000 for the Edmonton Power alternative to $135 000 for the Turner Group alternative. With respect to land cost the Board recognizes that only limited evidence was presented at the hearing, but believes that, if the evidence of the interveners respecting land acquisition costs were accepted, any benifit achieved thereby would be offset by additional construction costs.

Regarding the possibility of using steel poles for the entire transmission line, the Board requested and received from the applicant information on the cost of this alternative. The Board believes that expenditure of an additional \$1.4 million (see section 5.1) for this purpose would be unjustifiable in this instance. Similarly, the high cost of underground installation, estimated at \$2.2 million per mile, makes this alternative impracticable.

Environmental Aspects

In terms of physical impact, transmission lines do not create extensive surface disturbance and, in this case, the areas of disturbance should be confined to the tower sites and the access roads. Since most of the suggested alternative and proposed routes already have good accessibility, construction of new access roads and therefore additional surface disturbance should be minimal. The Board further notes that each of the routes suggested as alternatives to the applicant's proposed route would traverse lands that are extensively cultivated or presently subdivided for residential use. Therefore, from a land use viewpoint, the alternative routes appear to offer no significant advantages. Similarly the visual impact of the proposed line would not differ substantially for any of the considered routes and consequently the Board believes the alternative routes would not have a significant visual advantage over the proposed route.

Since the location of a suggested highway within the Restricted Development Area is still uncertain, the Board has not considered this matter in reaching its decision. However, it concurs generally with the concept of combining transmission lines and major arterial roads in a single corridor, so as to optimize land use.

The Board has considered the desirability of locating part of the north-south section of the proposed line within the Restricted Development Area and the remainder, from C to D in Figure 2, outside the Restricted Development Area. The Board accepts Edmonton Power's reasons for this as being reasonable.

The Board agrees that the proposed line might adversely affect the Parkland Drive-In Theatre since it would traverse some of the theatre's stalls. However, the Board believes any effect would be substantially reduced if Edmonton Power modified the design of the line so that the conductors would not overhang any of the theatre parking stalls. This could be accomplished by locating the centre-line of the transmission line structures as closely as possible to the eastern property boundary of the theatre, and ensuring conductor clearances well above the normal ground-level clearance. This may require the applicant to obtain easement or right of way east of the theatre if the applicant's modified design causes safety restrictions on development immediately east of the theatre.

If the applicant considers this modification of the proposed line impractical, the proposed route of the transmission line near the theatre will have to be re-examined with a view to diverting the line to the east of the theatre.

Technical Aspects

Regarding the technical aspects of the transmission line, the Board did not find that the alternate routes offered any advantages over the proposed route nor did it find the reverse to be true.

In summary, the Board concludes that the proposed route will be the shortest and the least costly of all the routes suggested, will have the least impact on traversed land; and will be equivalent to the alternative routes on technical grounds.

5 MINISTERIAL APPROVAL

The Hydro and Electric Energy Act, section 10, subsection (1), provides that the Board shall refer an application for a permit to the Ministers of the Environment and of Energy and Natural Resources for their approval of the application as it affects matters of the environment.

The Board, in compliance with section 10, has referred the application to those ministers, and those ministers having regard for the Board's disposition of the application insofar as it affects matters of the environment. For purposes of compliance with section 10, subsection (2), any permit issued by the Board will be made subject to the same conditions, if any, imposed by the Ministers of the Environment or of Energy and Natural Resources, when the Board gives its approval of the application.

Additionally, in accordance with section 4, subsection (2), of the Edmonton Restricted Development Area Regulations, the Board has obtained from the Minister of the Environment written consent to exercise the power granted to the Board under The Hydro and Electric Energy Act, with respect to the issuance of a permit for the construction and operation of the proposed transmission line within the Restricted Development Area concerned.

6 DECISION

The Board has publicly heard an application by Edmonton Power under sections 9, 11, and 14 of The Hydro and Electric Act, for approval of the construction and operation of a substation, designated as the Jasper Terminal Substation; a 240-kV double-circuit transmission line; and connection of the line to a Calgary Power line. The Board has studied the evidence submitted by the applicant and the interveners at the public hearing. As a result, it is prepared to grant the application, subject to those conditions prescribed by the Board and to the approval of the application by the Ministers of the Environment and of Energy and Natural Resources insofar as the application affects matters of the environment.

DATED at Calgary, Alberta, on November 24, 1976.

ENERGY RESOURCES CONSERVATION BOARD

V. Millard
Vice Chairman

LEGAL FRJA-4 CHAR-4 CAR-4 HEA-4
OGAR*4 ERAR-4 WAR-4 PLAR-4 CAR-4
IL-3 ILC-3 ILHE-3 ILOG-3 ILPL-3
IDC-3 ID-3 IDHE-3 IDOG-3 IDPL-3
CA-1 DEC-2 Gen-2 O&A-1

ENERGY RESOURCES CONSERVATION BOARD
Calgary Alberta

CU ENGINEERING LIMITED
GAS LINE FROM ATMORE TO THE FORT McMURRAY AREA

Decision 76-14
Application No.9446

1 INTRODUCTION

1.1 The Application and Hearing

CU Engineering Limited applied to the Board, pursuant to Part 4 of The Pipeline Act, 1975, for a permit to construct a gas line for the transmission of natural gas from a point in the southeast quarter of section 32, township 67, range 17 west of the 4th meridian (near Atmore), to a point in the southwest quarter of section 7, township 93, range 10, west of the 4th meridian (near the Mildred Lake Extraction Plant of Syncrude Canada Ltd.), as indicated on the attached map. The proposed pipeline would comprise some 170 miles of 16-inch pipe.

The application was heard before a panel of its members appointed for that purpose by the Energy Resources Conservation Board. The hearing was held in Edmonton on November 9, 1976, with D.R. Craig, P.Eng., and V.E. Bohme, P.Eng., sitting.

The following appeared at the hearing.

	WITNESSES
CU Engineering Limited (CU Engineering) represented by D.R. Bailey	T.O. Neumann, P.Eng. D. Murray, P.Eng.
	Northwestern Utilities Limited and Canadian Western Natural Gas Company Limited L. Graburn, P.Eng.
	Syncrude Canada Ltd. G.R. Gray, P.Eng.
	Spence Taylor & Associates Limited R.S. Taylor, P.Geol.
	Canadian Engineering Surveys Co. Ltd. L.E. Raessler

NOTE: Abbreviations shown in parentheses are used in this report.

Albersun Pipeline Ltd. (Albersun)
represented by R.C. Egglestone, P.Eng.

Alberta Oil Sands Pipeline Ltd.
(Alberta Oil Sands Pipeline)
represented by B.D. Gilchrist

The Alberta Gas Trunk Line Company
Limited (Trunk Line)
represented by G.R. Forsyth, Q.C.

Trans Canada Pipe Lines Limited
(Trans Canada)
represented by E.W.H. Mallabone
and A.A. Wilkins

Simmons Pipelines Limited
(Simmons)
represented by M.A. Putnam

Native Outreach
represented by Ms. M. Venne

Energy Resources Conservation
Board Staff
represented by A.L. McLarty,
R.J. Allman, P.Eng., and
J.S. Owen

2 DEFINITION OF ISSUES

The Board considers the main issues of this application to be:

a) the need for a pipeline,
b) the suitability of the proposed route, and
c) the suitability of the design and test medium.

The Board also considers that other matters relevant to this application are:

a) the ownership and operator of the pipeline,
b) environmental concerns,
c) the amount of recoverable crude bitumen under the pipeline right of way, and
d) native people's concerns regarding construction of the pipeline.

3 VIEWS OF THE APPLICANT

3.1 Need for the Pipeline

Concerning the need for the pipeline, CU Engineering referred to Board Approval No. 1920 which authorized Syncrude Canada Ltd. to use natural gas at its Mildred Lake plant. It also stated that no viable alternative to the proposed pipeline exists. The applicant presented evidence to show that Albersun's pipeline does not have sufficient capacity to supply Syncrude's requirements, nor is it economical to either upgrade the Albersun line or to apply to it a combination of looping and compression. The applicant also explained that the supply of gas to Syncrude is critical to the timing of the various elements of plant construction and to the commencement date of synthetic crude production.

CU Engineering said that the compressor station associated with the application would be applied for separately at a later date since the final station location was dependent on the sources of gas supply and their location relative to the pipeline.

3.2 Route of the Pipeline

The applicant stated that the final route selection was based on three main considerations, namely, proximity to gas reserves, the existence of an approved transportation corridor, and the parallelling of the Alberta Oil Sands Pipeline which is to be built at the same time. It was also indicated that other factors such as satisfactory river crossing locations, the distance away from inhabited areas, and the suitabilily of terrain also influenced the final decision.

The applicant stated that alternative routes had been investigated and that the final choice best met its requirements. Other benefits would accrue from planned coordination of activities with Alberta Oil Sands Pipeline such as the construction of two major river crossings, the use of two adjacent rights of way which would reduce the requirement for extra working space along the route, and simplification of reclamation procedures if done at the same time for both lines.

In answer to questions, the applicant stated that it had no policy that would preclude supplying gas to communities along the pipeline route, and in fact would be prepared to do so provided that Syncrude's operations were not jeopardized as a consequence.

Concerning the status of landowners along the route of the pipeline, CU Engineering stated that 75 per cent of the freehold land had been acquired and none of the remaining unsigned landowners and occupants were objecting to the route. Approval to construct on Crown-owned land had been applied for, but the expected authorization from Alberta Energy and Natural Resources was awaiting the outcome of the subject application.

3.3 Design and Test Medium

The applicant stated that a full and detailed design for the pipeline had been set out in its report to the Board, and that no new evidence would be presented at the hearing.

CU Engineering pointed out that in its application it had requested Board approval to use air instead of water as the medium for testing the newly installed pipeline. The applicant explained that the preference for using air rather than water was based on a number of considerations, namely the difficulties of testing with water under winter conditions. In particular, the applicant was concerned about the cooling down and freezing of water during testing, and the possibility that after the line became operational, the gas supply to Syncrude could be seriously jeopardized if moisture in the gas stream caused freezing conditions in regulating or valve equipment. The applicant agreed, however, that heating arrangements could overcome some of these problems. In addition the applicant stated that the disposal of the test water could lead to pollution problems, and water was also unsatisfactory for locating small leaks in water-covered areas.

In support of the use of air as a test medium, the applicant contended that since the majority of the pipeline route was through uninhabited territory, a rupture during a test would not likely cause injury to personnel, and in any case, the pipeline would be tested in sections, and special efforts would be made to ensure that all work crews were kept away from the line under test. CU Engineering agreed that a rupture during an air test was more severe than from a water test, but emphasized that all possible precautions would be taken to keep people and equipment out of the vicinity of the tests. Concerning the hazard of air tests to highway traffic, the applicant noted that heavy-wall pipe would be used under major highway crossings, and the proposed line was a substantial distance away from the highway where the routes were parallel.

The applicant expressed confidence that small leaks could be detected in long test sections when using air as the test medium. In support of this, the applicant indicated that dead weight gauges would be used to record pressure, and that temperature changes would be taken into account. In the event a small drop in pressure occurred, the pipeline under test would be walked, and if necessary, odorant would be introduced into the line.

As requested, the applicant, following the hearing provided estimates of additional costs associated with the use of water versus air as a test medium in winter. This information revealed that costs for testing with water could be some $80,000 higher than for testing with air.

3.4 Ownership and Operation

Concerning the questions of ownership and operation of the pipeline, the applicant indicated that the owners at the date of the hearing were the participants in the Syncrude project. The applicant stated that those participants, through Syncrude Canada Ltd. were negotiating with Simmons Pipelines Limited for the purchase by and sale to Simmons of the pipeline. The applicant also indicated that although neither it nor any of its Canadian Utilities Limited affiliates would become involved in the ownership of the pipeline, it was the intent of the owners that CU Engineering would become the operator of the pipeline. Mr. Gray of Syncrude, appearing on behalf of the applicant confirmed the intent of the owners that CU Engineering would operate the pipeline.

3.5 Environmental Matters

Insofar as environmental matters were concerned, the applicant referred to two reports by Spence Taylor & Associates Limited, and stated that the analyses were similar to those made for Alberta Oil Sands Pipeline. No further field investigations of any significance had been made and the conclusions arrived at for the CU Engineering line were the same. The applicant undertook to follow all of the recommendations in the environmental reports.

3.6 Recoverable Crude Bitumen

On the subject of recoverable crude bitumen under the pipeline right of way, CU Engineering observed that the proposed gas line and proposed oil line would occupy a joint 60-foot easement through the mineable oil sands area (Syncrude Lease 17), and that this would minimize the sterilization of recoverable crude bitumen. The applicant further stated that should an order be issued in the future to move the pipeline, it would comply with the order subject to a proper hearing and a direction as to payment of costs.

3.7 Concerns of the Native People

With regard to need for employment of native people during construction of the line, as attested to by Ms. M. Venne of Native Outreach, the applicant said that it was its understanding that Syncrude's declared policy was to support the hiring of native and local people wherever possible, and CU Engineering would comply with this policy.

4 VIEWS OF THE INTERVENORS

4.1 Native Outreach

Native Outreach was concerned with the damage that might occur to traplines along the route of the pipeline, and the possibility that the livelihood and rights of trappers would suffer. The intervenor asked whether compensation would be paid in such cases and to what extent it would cover the trappers' losses. Native Outreach also stated that it was concerned respecting the employment of native people on the pipeline construction, and indicated that trained labour in Fort McMurray and Lac La Biche was available for certain phases of pipeline work.

4.2 Albersun Pipeline Ltd.; Alberta Oil Sands Pipeline Ltd.; The Alberta Gas Trunk Line Company Limited; Trans Canada Pipe Lines Limited; Simmons Pipelines Ltd.

None of the above noted intervenors presented evidence relating to the application, and limited their participation to cross examination of the applicant and to closing argument.

5 VIEWS OF THE BOARD

5.1 Need for the Pipeline

The Board agrees with the applicant that the proposed pipeline is required to transport natural gas to the Syncrude plant from sources near the line, and that all reasonable alternatives have been investigated. The size of the pipeline proposed by the applicant is, in the Board's view, reasonable and acceptable. It is noted that although a compressor station is an integral part of the pipeline design, its final location is still uncertain, and a separate application for the station will be made to the Board in the future.

5.2 Suitability of the Proposed Route

The Board notes that the intended route will closely parallel the route of the proposed Alberta Oil Sands Pipeline, and that this will provide the advantage of coordinating certain pipeline activiites and also reduce fragmentation of land. The Board notes that Syncrude is prepared to supply communities along the route of the line, provided that Syncrude's operations are not jeopardized. The Board considers it significant that the route selected was not opposed by any of the potentially affected landowners. For these reasons, the Board is satisfied that the proposed routing of the pipeline is appropriate, and best meets the needs of the applicant with minimum adverse effect on land use and the environment.

5.3 Design and Test Medium

Except for the question of test medium, the Board is satisfied that the general engineering design of the proposed pipeline is adequate for the purpose, and is in conformance with the requirements of The Pipeline Act, 1975. Concerning the use of air as a test medium, the Board is not convinced that the safety of personnel in the vicinity of the tests could be adequately ensured, given the high stress levels that would be developed in the pipe during the tests, and the long lengths of test sections involved. The Board doubts that small leaks could be accurately detected in test sections of 40 miles in length. The Board recognizes the difficulties of using water as a test medium during winter conditions but observes that other long, large diameter lines have been successfully tested during winter conditions using heated water.

Taking all these factors into account, the Board is prepared to allow the use of air for testing on some sections of the line provided that the applicant would be prepared to significantly reduce the length of each test section, and to show that arrangements could be made to protect the safety of personnel in the vicinity of the tests. The Board will require submission of a detailed test procedure before approving air as the test medium.

5.4 Other Matters.

5.4.1 Ownership and Operator

The Board, having regard for the permitting and licensing provisions of The Pipeline Act, 1975, is satisfied that CU Engineering is a person entitled under the Act to apply for a permit to construct and a licence to operate the pipeline. The board notes that any permit or licence that may be issued to CU Engineering could not be transferred by CU Engineering to any other person, unless with the consent of the Board, given pursuant to section 24 of The Pipeline Act, 1975.

5.4.2 Environmental Matters

On the subject to environmental impact of the pipeline, the Board notes that firstly, none of the intervenors expressed views in this regard, and secondly the major environmental concerns have been fully covered in the two reports by Spence Taylor & Associates Limited. In addition to this, the Department of the Environment stated that it had no objection to the proposed route. The Board is satisfied that the applicant intends to follow the recommendations in the environmental reports, but would require that final river crossing designs be forwarded to the Board for approval prior to construction.

5.4.3 Recoverable Crude Bitumen

The Board believes the location of the line may overlie significant recoverable reserves of crude bitumen which may necessitate the relocation of the gas line within twenty years. The Board however is prepared to accept the proposed route in this area, but would require the applicant to relocate the line if it should be determined that such is in the public interest.

5.4.4 Concerns of the Native People

With respect to the concerns of the native people with the pipeline, the Board recognizes these concerns but finds that it is not a matter the Board can deal with directly. The Board notes, however, that the matter of native people's participation in construction of the pipeline will be followed up with discussions between officials of Native Outreach and Syncrude, and would expect that appropriate action will be taken by the applicant in the matter of the rights of owners of registered traplines.

6 RECOMMENDATION

The sitting members reported to the Board and recommended that the application of CU Engineering Limited be granted, and that a permit for the construction of the proposed pipeline be issued.

7 DECISION

The Board grants the application of CU Engineering Limited and is issuing a permit for the construction of the proposed pipeline, concurrent with this decision.

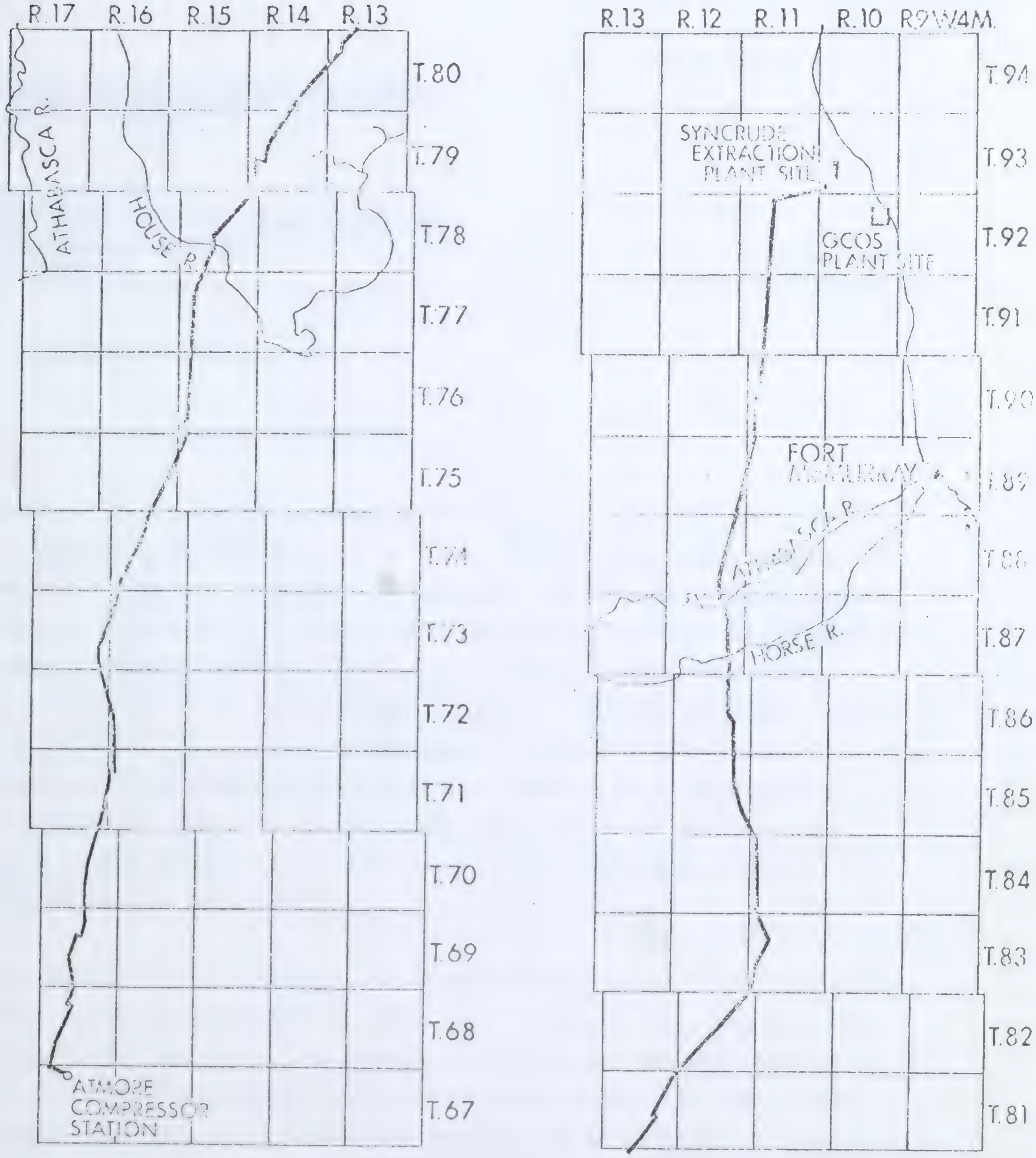
DATED 29 November 1976
Calgary Alberta

ENERGY RESOURCES CONSERVATION BOARD

DR Craig

D.R. Craig
Vice Chairman

attachment



ATMORE — FORT McMURRAY AREA

——— PROPOSED 16" CU ENGINEERING LIMITED NATURAL GAS PIPELINE (APPLICATION No. 9116)

Attachment to Decision 76-14

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OGAR*4 IRAR-4 IVAR-4 PLAR-4 CAR-4
IL-3 ILC-3 ILHE-3 ILOG-3 ILPL-3
IDC-3 IL-3 IDHE-3 IDOG-3 IDPL-3
CA-1 DEC-2 Gen-2 O&A-1

ENERGY RESOURCES CONSERVATION BOARD
Calgary Alberta

TEXASGULF INC.
SECONDARY LINES FOR TRANSMISSION OF
FUEL GAS AND SOUR GAS
OKOTOKS AREA

Decision 76-15
Applications 9183, 9184

1 INTRODUCTION

1.1 The Application and Hearing

Texasgulf Inc. applied pursuant to The Pipeline Act, 1975 for permits to construct two secondary lines in the Okotoks area. Application 9183 was for a permit to construct a secondary line for the transmission of fuel gas from a point in Legal Subdivision 10 of Section 31, Township 20, Range 28, West of the 4th Meridian to a point in Legal Subdivision 11 of Section 20, Township 20, Range 28, West of the 4th Meridian. Application 9184 was for a permit to construct a secondary line for the transmission of sour natural gas from a point in Legal Subdivision 11 of Section 20, Township 20, Range 28, West of the 4th Meridian to a point in Legal Subdivision 14 of Section 36, Township 20, Range 29, West of the 4th Meridian.

The hearing of both applications commenced on May 20, 1976, at Calgary, Alberta, with D. R. Craig, P. Eng., V. E. Bohme, P. Eng. and N. A. Macleod, Q.C. sitting. The Board decided that the two applications would be heard sequentially, commencing with Application 9183. Upon completion of the hearing of that application, the hearing of Application 9184 commenced and, upon application therefor, was adjourned sine die. The hearing of Application 9184 was recommenced on June 9, 1976, at Calgary, Alberta, with D. R. Craig, P. Eng., V. Millard and V. E. Bohme, P. Eng. sitting.

Interventions to the two applications were submitted by the Archaeological Society of Alberta, the Municipal District of Foothills, Rio Frio Ranch Ltd. and J.R. Walker. Mr. A.S. Leduc, Mr. K. Long and

Sheep Creek Developments Limited submitted interventions to Application 9184 only. The Archaeological Society of Alberta and Mr. J.R. Walker were not represented at the hearing.

1.2 Appearances

Participants who attended the hearing are listed in the following table. Where the name of a party is abbreviated in this report, the abbreviation is set out in parentheses after the party's name in the table.

Representatives	Witnesses
Texasgulf Inc. (Texasgulf)	
D. P. McLaws, Q.C. G. T. Conn, P. Eng.	S. W. Odut, P. Eng. D. H. Davies T. S. Anderson R. Cunes
A. S. Leduc	
H. V. O'Connor	
K. Long	
R. A. F. Montgomery	K. Long
Municipal District of Foothills (M.D. of Foothills)	
	D. J. Hunt
Rio Frio Ranch Ltd.	
	E. E. McNally
Sheep Creek Developments Limited (Sheep Creek)	
T. F. McMahon	M. Melton
Energy Resources Conservation Board (Board Staff)	
A. L. McLarty K. G. Sharp, P. Eng. G. W. Dilay	E. R. Brushett, P. Eng.

2 PRELIMINARY MATTERS

Several matters were brought up during the hearing which the Board believes it should comment on. One is the definition of the theoretical 100 parts-per-million hydrogen sulphide isopleth (100-ppm H_2S isopleth). This is the concentration of hydrogen sulphide expressed in one million parts of air. Assuming an uncontrolled release of sour gas from any point along a sour gas pipeline, it is possible to compute the theoretical dispersion of the released gas, including the hydrogen sulphide component, and predict the ground level concentration of hydrogen sulphide which would exist at any distance from the point of release. A line joining locations of equal ground level concentration, computed in this manner, is called a hydrogen sulphide isopleth. In a recent report[1] it was recommended that, in general, no new subdivision developments be permitted within a 100-ppm H_2S isopleth of any sour gas operation.

Another matter arose from a statement made by counsel for Sheep Creek that, in order to satisfy Section 29(2) of The Energy Resources Conservation Act, the notice of hearing should have been sent to all persons who live or own land within the theoretical 100-ppm H_2S isopleth that would be created by the proposed sour gas pipeline. The Board notes that Section 35(2) of the Act directs that the Board shall give, or may require to be given, such notice of an application to, or a hearing by, the Board as the Board considers necessary. The Board published the notice of hearing in the major Calgary and Edmonton newspapers and the local newspaper. In addition, individual notices were distributed to all landowners along the route of the proposed pipeline. The Board believes that this represents reasonable and proper advertising.

A further item that requires clarification concerns the Board's jurisdiction and involvement with approvals for proposed subdivision of land within the theoretical 100-ppm H_2S isopleth. Applications for subdivision of land are made to regional planning commissions or other planning bodies having the authority to rule on these applications. Proposed subdivisions located near sour gas facilities may be referred by planning authorities to the Board for advice. If they are referred, the Board staff review the applications and advise the planning authorities respecting the location of oil and gas wells, pipelines and other facilities for the production of oil and gas. The Board staff also confirms the location of the theoretical 100-ppm H_2S isopleth submitted with the applications from developers. However, the Board does not have any authority respecting approvals for subdivision of land.

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[1] A Report by the Alberta Industry Government Sour Gas Environmental Committee on Guidelines for Urban Development in Relation to the Sour Gas Industry, October, 1974

3 ISSUES

Since there were no objections to the sweet fuel gas pipeline proposed in Application 9183, only the sour gas pipeline proposed in Application 9184 will be discussed. Texasgulf indicated that the fuel gas pipeline would not be constructed if the application for the sour gas pipeline was not approved.

The Board believes that the important issues, with respect to the sour gas pipeline, are:

1. Necessity for the pipeline;
2. Alternative routes;
3. Safety of the pipeline; and
4. Effect of the pipeline on subdivision of land.

3.1 Necessity for the Pipeline

3.11 Views of Texasgulf

Texasgulf stated that the proposed pipeline was necessary in order to transport gas required to maintain the throughput at the Okotoks gas plant and to allow the owners of Okotoks Gas Unit Number 2 (Unit 2) to produce their gas and protect their correlative rights. The sour gas well (11-20-20-28 W4M), that Texasgulf would connect to the existing gas gathering system if the subject application were granted, was drilled and completed during August, 1969. The well encountered production from the Crossfield formation, a known sour gas zone in the Okotoks gas field. The well was not connected to the existing gathering system in 1969 due to poor economics caused by the relatively low price for gas which existed at that time. Texasgulf stated that bottom-hole pressure surveys on the suspended well, 11-20-20-28 W4M, indicated that the reservoir beneath the well was being drained by wells in Okotoks Gas Unit Number 1 (Unit 1). The applicant indicated that during the period from 1970 to 1975 approximately 1 to 1.25 Bcf of gas had been drained from Unit 2.

Texasgulf indicated that additional gas from well 11-20-20-28 W4M would prolong the life of the Okotoks gas plant, possibly by three to five years. The applicant also stated that producing this well would result in a marginal increase in the overall recovery of gas from the Okotoks field. Texasgulf estimated the reserves of gas underlying Unit 2 to be 25 Bcf and estimated that only 10 to 20 per cent of these reserves could be recovered by drainage from existing wells in Unit 1.

3.12 Views of the Interveners

In closing argument, counsel for Mr. Long suggested that the purpose of the pipeline was not only to connect well 11-20-20-28 W4M but a first step to establish a gathering system for wells east of the Okotoks field. Otherwise, Mr. Long did not contest the necessity for the pipeline.

3.13 Views of the Board

The Board staff has estimated the initial gas in place in Unit 2 to be 33.8 Bcf, and further estimates the drainage from Unit 2, by wells located in Unit 1, to be between 1.5 and 3.5 Bcf. Board staff have also estimated the present worth of the incremental recovery of gas, which would result from producing gas from Unit 2, to be $8.1 million. Additional revenue would also be realized from the sale of sulphur that would be recovered from the gas. The Board notes that producing gas from Unit 2 would prolong the life of the Okotoks gas plant, and thus increase the overall recovery of gas in Unit 1. The Board concludes there is a need for a pipeline to provide an opportunity for the applicant to obtain his share of production from the gas pool.

The Board notes that, while there has been some drainage of the reserves of gas under Unit 2, the applicant had chosen not to produce the well 11-20-20-28 W4M after it was originally drilled. However, the Board agrees that further drainage would be minimized and correlative rights of the operators of Unit 2 would be protected if the well were produced.

With respect to the allegation by one of the interveners that Texasgulf's objective could be to tie-in additional wells located east of the Okotoks field, the Board observes that this was not the subject of the current application and any proposal to extend the pipeline would require an additional application to the Board.

3.2 Alternative Routes

3.21 Views of Texasgulf

Texasgulf stated that the route it had selected would cause the least number of environmental problems. It would cross the Sheep River at the best location, make use of existing pipeline rights of way and improve Texasgulf's operation by combining the flow of gas from wells 10-31-20-28 W4M and 10-36-20-28 W4M with that from well 11-20-20-28 W4M, thus reducing the need for line heaters. Texasgulf indicated that the proposed route had been established, in some cases, to comply with the requests of landowners. At the hearing, Texasgulf stated that it had considered and rejected two alternative routes. A direct route from the well 11-20-20-28 W4M to the Okotoks gas plant was rejected because it would pass by residences that had been established in the area for many years, involve a major highway crossing, and extend the theoretical 100-ppm H_2S isopleth over a government campground. A route directly north from well 11-20-20-28 W4M to well 10-31-20-28 W4M was rejected because it would not coincide with landowners' plans for future development and would require the pipeline to cross the Sheep River at a location where the banks were excessively steep. Texasgulf stated that the route proposed by Sheep Creek would probably cause as much inconvenience to as many people as the route the applicant had proposed. Texasgulf also stated that none of the routes suggested by the interveners would inconvenience fewer people than the route it proposed.

3.22 Views of Mr. Long

While counsel for Mr. Long stated that he recognized the route proposed by Texasgulf was the cheapest way to produce well 11-20-20-28 W4M, he contended that the applicant had not seriously considered alternative routes and that a permit should be withheld until the applicant had considered such possibilities as a northerly route along the east boundary of 30-20-28 W4M or a westerly route directly from well 11-20-20-28 W4M to the Okotoks gas plant. In answer to questioning, Mr. Long said he was opposed to the alternative route proposed by Sheep Creek because his land would still lie within the theoretical 100-ppm H_2S isopleth.

3.23 Views of Sheep Creek

Sheep Creek submitted that the pipeline should be routed in a more northwesterly direction which would involve no major problem with the crossing of the Sheep River and would have a minimal effect on developed property. However, when questioned, Sheep Creek stated that the specific advantage of the alternative route would be to relocate the theoretical 100-ppm H_2S isopleth to a location which would affect less of Sheep Creek's property.

3.24 Views of the Board

The Board is satisfied that sufficient consideration was given to alternative routes and concurs with the applicant that a direct route from well 11-20-20-28 W4M to the Okotoks gas plant, or a route directly north from well 11-20-20-28 W4M to well 10-31-20-28 W4M, would be less desirable than the proposed route. Furthermore, the routes suggested by the interveners would not eliminate the problem but would merely transfer it to a different location. The Board agrees that the route selected by Texasgulf was the most appropriate route proposed, having regard for the location of the crossing of the Sheep River and existing pipeline systems.

3.3 Safety of the Pipeline

3.31 Views of Texasgulf

Texasgulf stated that the proposed pipeline had been designed to meet all the Board's requirements for safety. The applicant submitted that well 11-20-20-28 W4M would be equipped with a subsurface safety valve and that similar valves on the existing wells in the Okotoks field had never failed to close during monthly tests. Texasgulf further stated that it was willing to accept any conditions the Board may wish to impose related to the safety and inspection of the proposed pipeline.

3.32 Views of the Interveners

In closing argument, counsel for Sheep Creek stated that the Board should consider imposing sufficient safety requirements for the proposed pipeline so that land development in the area could proceed.

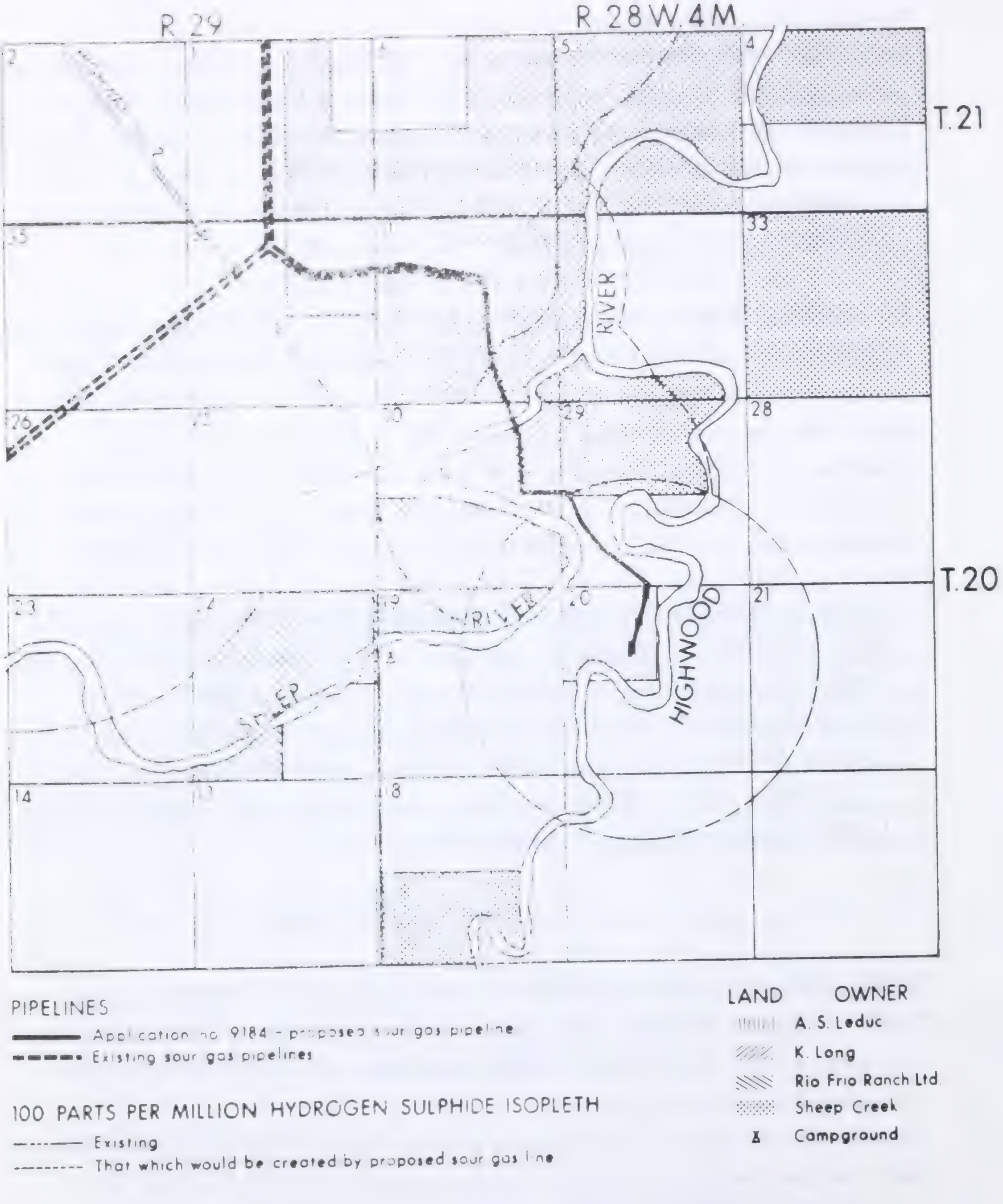
3.33 Views of the Board

The Board is satisfied that Texasgulf has included sufficient safety measures in the design of the proposed sour gas pipeline and that the design will comply with the regulations established pursuant to The Pipeline Act, 1975, and The Oil and Gas Conservation Act. The Board notes that Texasgulf will be required to maintain an adequate inspection and maintenance program, which meets the Board's regular requirements for pipelines transmitting sour gas. However, the Board realizes that, in spite of the extensive safety precautions proposed by the applicant, it is not possible to be absolutely certain that no failure would occur in the proposed sour gas pipeline.

The data contained in the report[1] by the Sour Gas Environmental Committee, plus the Board's data for 1975, indicate there have been 61 breaks in pipelines transmitting sour gas in Alberta during the period 1971 to 1975. Four of these breaks resulted from accidental cutting of the pipelines, which would usually result in the escape of a large volume of sour gas. The remaining 57 breaks were caused by corrosion of the pipelines (one was caused by failure of the valve packing) and would likely result in the escape of a relatively small volume of sour gas. In relation to the total length of sour gas pipelines in operation annually, the data indicates a frequency of 0.22 serious breaks per year per 1000 miles of pipeline and 3.3 less serious breaks per year per 1000 miles. (The calculation assumes one mile of pipeline for each of the 3700 wells producing sour gas in Alberta.) Based on these considerations, the Board believes the risk of a serious incident arising from the proposed sour gas pipeline is low.

3.4 Effect of the Pipeline on Subdivision of Land

A map indicating the location of the proposed sour gas pipeline and other pertinent information is shown in Figure 1. Figure 1 includes the theoretical 100-ppm H_2S isopleth generated by well 11-20-20-28 W4M. Although this isopleth was not included in the data contained in the report[1] by the Sour Gas Environmental Committee, the potential for the well to blow out and produce the predicted 100-ppm H_2S isopleth did exist. Figure 1 shows that a portion of the land affected by the theoretical 100-ppm H_2S isopleth calculated for the pipeline lies within the one calculated for the well.


R. 29
R. 28 W. 4 M.
T. 21
T. 20
2
1
5
4
35
36
33
26
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30
29
28
23
24
19
20
21
14
13
18
RIVER
HIGHWOOD
SHEEP
RIVER
PIPELINES
Application no. 9184 - proposed sour gas pipeline
Existing sour gas pipelines
100 PARTS PER MILLION HYDROGEN SULPHIDE ISOPLETH
Existing
That which would be created by proposed sour gas line
LAND OWNER
A. S. Leduc
K. Long
Rio Frio Ranch Ltd.
Sheep Creek
Campground

FIGURE 1 OKOTOKS GAS FIELD

3.41 Views of Texasgulf

Texasgulf submitted that the subdivision proposed by Mr. Long, in 30-20-28 W4M, was in the formative stage only and had not been submitted to the proper authorities for approval. Texasgulf also submitted that it was not aware of any proposed additional development within the theoretical 100-ppm H_2S isopleth calculated for the sour gas pipeline. The applicant stated that there were no campgrounds or recreational areas in the immediate vicinity of the proposed pipeline, with the exception of a private boys' camp located in the north-west quarter of 30-20-28 W4M. However, in reply to questions asked at the hearing, Midwest Surveys Co. Ltd., who were retained by Texasgulf to select a route for the pipeline, stated that it had not travelled throughout the area to ascertain what development existed within the area of the theoretical 100-ppm H_2S isopleth.

Texasgulf conceded that subdivision of land within the theoretical 100-ppm H_2S isopleth could be limited by the proposed pipeline and that development of high-density subdivisions within the theoretical 100-ppm H_2S isopleth could be curtailed. Texasgulf stated that no high-density subdivisions should be allowed within the theoretical 100-ppm H_2S isopleth, where high-density subdivision referred to development such as a town or village in which fifty or more persons could occupy an acre of land. However, Texasgulf said it would have no objection to the development of small holdings, as small as 2 or 3-acre parcels, within the theoretical 100-ppm H_2S isopleth and certainly that 20-acre lots could co-exist with the proposed pipeline.

3.42 Views of Mr. Long

Mr. Long stated that he had proposed to subdivide his land in 30-20-28 W4M into 17 to 20-acre plots. He further stated that he had informally contacted the Calgary Regional Planning Commission regarding his proposed subdivision, but had not submitted a formal application. Mr. Long submitted that the proposed pipeline would sterilize the bulk of his prime land from development because the policy of the Calgary Regional Planning Commission did not allow new subdivisions within the theoretical 100-ppm H_2S isopleth.

3.43 Views of M.D. of Foothills

The M.D. of Foothills reported that the south-east, south-west and north-east quarters of 6-21-28 W4M and the north-east and -west quarters of 31-20-28 W4M had been reclassified from General Agriculture to Small Holding with a maximum density of seven 4-acre parcels and one 132-acre parcel per quarter-section, but that no formal application for subdivision had been made. The M.D. of Foothills also reported that subdivision of a 26-acre parcel in the north- and south-east quarters, and a 23-acre parcel in the north-west quarter of 30-20-28 W4M had been approved but that the approval for the 23-acre parcel in the north-west quarter of Section 30 had expired.

Mr. Hunt, a counsellor for the M.D. of Foothills, stated that the M.D. of Foothills would be opposed to subdivision within the theoretical 100-ppm H_2S isopleth. The M.D. of Foothills took the position that the sour gas pipeline should not be placed on lands that had been approved for 'high-density' development, where high-density meant quarter-sections with more than one residence; or 'near' existing farm dwellings, where near meant within the theoretical 100-ppm H_2S isopleth.

3.44 Views of Sheep Creek

Sheep Creek stated that it had obtained approval from the Provincial Planning Board for reclassification of three-quarters of 6-21-28 W4M and all the north half of 31-20-28 W4M. In answer to questions, Sheep Creek stated that most of this land was within the existing theoretical 100-ppm H_2S isopleth and that only a small portion of the land would be effected by the theoretical 100-ppm H_2S isopleth calculated for the proposed pipeline. Sheep Creek stated that its present plans were for the creation of 4-acre parcels, but that it intended to create 2-acre lots in the future, if anticipated legislative changes would allow such parcels.

Sheep Creek submitted that the effect of the proposed pipeline would be to prohibit development of its land as residential small holdings. It submitted that an application made to the Calgary Regional Planning Commission to consolidate the densities to allow the creation of fifteen 4-acre parcels in the north half of 31-20-28 W4M and twenty-five 4-acre parcels in the south half and north-east quarter of 6-21-28 W4M, was refused because this type of development was not provided for in the Subdivision and Transfer Regulations and because of the recommendations contained in the report[1] by the Sour Gas Environmental Committee.

3.45 Views of the Board

As indicated in Section 2 of this report, the Board does not have any jurisdiction regarding the subdivision of land. Nevertheless, since future subdivision of land was one of the major concerns of the interveners, the Board has given consideration to the impact that the proposed pipeline could have on residents who may live within the 100-ppm H_2S isopleth. The Board believes the following factors should be considered:

(a) risk of an accident occurring,
(b) duration of exposure to hydrogen sulphide,
(c) population density near the pipeline,
(d) mechanical safeguards on the pipeline,
(e) degree of attendance at the proposed sour facility,
(f) meteorological conditions,
(g) duration of occupancy of a building or public facility near the pipeline,
(h) life of well and reservoir characteristics, and
(i) emergency procedures plan.

The Board's views with respect to each of these factors are as follows:

(a) Risk of an Accident Occurring

Based on the Board's records of pipeline failures in both the Okotoks field and the entire Province, the Board believes that the risk of an uncontrolled release of a large volume of sour gas from the proposed pipeline is low.

(b) Duration of Exposure

Having regard for the proposed shut down safety devices on the pipeline and well, the Board believes that, should a pipeline burst actually occur, the high ground level concentrations would disperse within 10 to 20 minutes to levels which are not hazardous to human health. However, it must be recognized that ground level concentrations greater than 500-ppm of H_2S, which could be fatal, would exist for a few minutes within approximately 1800 feet downwind of the burst site.

(c) Population Density

Currently there are only a few dwellings near the proposed pipeline and the Board believes the pipeline could certainly co-exist with this low population density. If the proposed development plans referred to at the hearing were proceeded with, the concentration of residents within the 100-ppm H_2S isopleth would be increased. However, with the exception of the 2-acre lots proposed by Sheep Creek, the Board believes the concentration of residents within the 100-ppm H_2S isopleth would still be at an acceptable level. On the other hand, the Board does not believe that the proposed pipeline would be compatable with high-density urban development.

(d) Mechanical Safeguards

As mentioned in Section 3.33, the Board is satisfied that the pipeline is being designed in accordance with high standards, and that the safety shut down devices, to be installed, would minimize the risks.

(e) Degree of Attendance

The Board realizes that it is not practical to have persons in attendance 24 hours a day at either the pipeline or well, and this aspect increases the risk relative to a fully manned sour gas operation. On the other hand, the Okotoks plant is manned on a 24-hour basis and the operation of all producing wells are telemetered to the plant so that any major burst would be detected by the plant operators almost immediately. This would allow the operator to implement his emergency procedure plan within a short period of time.

(f) Meteorological Conditions

The Board understands that the area in question is not subject to unique, local meteorological occurrences and, accordingly, this factor does not require special consideration.

(g) Duration of Occupancy

The Board recognizes that near full time occupancy is the status of most of the homes in the area now, and will likely be the case in the future. Therefore, this factor militates against the installation of the proposed pipeline.

(h) Life of Well and Reservoir Characteristics

The Board notes that while the Okotoks field has been operating for some years, the remaining life of this well and the Okotoks plant is expected to be 15 to 20 years. Although decreasing production rates and pressures would reduce the areal extent of the 100-ppm H_2S isopleth, the isopleth would still have a bearing on development in the area for some time.

(i) Emergency Procedures Plan

Texasgulf has an emergency procedures plan and will be required by the

Board, as outlined in Interim Directive ID-OG 76-2, to test it regularly and modify it if necessary.

After weighing all of the foregoing factors, the Board believes that the risks associated with the proposed sour gas pipeline are not so large as to warrant complete prohibition of any subdivision within the 100-ppm H_2S isopleth.

The type of subdivision involving 20-acre parcels referred to by some of the interveners would appear to the Board to be compatable with the proposed sour gas facility. The Board believes that the Alberta Industry Government Sour Gas Environmental Committee intended that its recommendations concerning new subdivision development would refer to high-density development and not country residential type development. The Board has assisted the Provincial Planning Board in developing guidelines for subdivision of land within the 100-ppm H_2S isopleth. These guidelines, which are intended to clarify the types of subdivisons allowed, should be issued shortly and the Board plans to concurrently issue its own guidelines regarding the location of new sour gas facilities near populated areas.

4 CONCLUSION

In summary, the Board concludes that the proposed pipeline is needed to protect correlative rights and for conservation reasons, that the route proposed is satisfactory, and that the safety measures proposed fully meet the requirements established by the Board.

While the proposed pipeline could have an unfavourable impact on plans to subdivide land adjacent to the pipeline route, the Board believes this would not completely inhibit all development in the lands adjacent to the right of way.

5 DECISION

5.1 Application 9183

The Board grants Texasgulf's application for a permit to construct a fuel gas pipeline from a point in 10-31-20-28 W4M to a point in 11-20-20-28 W4M. The appropriate permit will be issued to Texasgulf in due course.

5.2 Application 9184

The Board grants Texasgulf's application for a permit to construct a sour gas pipeline from a point in 11-20-20-28 W4M to a point in 14-36-20-29 W4M. The appropriate permit will be issued to Texasgulf in due course.

ENERGY RESOURCES CONSERVATION BOARD

D. R. Craig
Vice Chairman

DATED December 23, 1976
Calgary Alberta

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